

A M A T E U R R A D I O



Vol. 33, No. 11



NOVEMBER
1965

2/6

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paid, in advance. Issued monthly on the
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OUR COVER

W.I.C.E.N. repeater, mobile and
link set-up at Mt. Alexander, 20
miles south of Bendigo. Left to right:
VKs 3ZIS, 3ZCO, 3ZEL, 3ARZ.

FEDERAL COMMENT

★

Over the past year or two the emergence of the Youth Radio Scheme
can reasonably be ranked as one of the more dynamic occurrences within
the Institute.

From our point of view it can reasonably be assumed that the Y.R.S.
member of today will become the active Institute member of the future
and that, by the process of natural selection, some of these future members
will eventually shoulder the vital administrative work of our organisation.

But might it not be to our advantage if we pondered on the wider
implications involved? Especially the part now played by the local radio
club or society. Most of these radio clubs—and there are eighty-six of
them listed in last year's Call Book—came into existence because there
was a need for a local organisation to cater for the gregarious, sociability
and educational needs of the Amateur. Services which at times the
Institute is often ill equipped to supply on a local basis.

Once formed there exists a strong probability that some of the mem-
bers of such clubs will also become Institute members and what better
place to find people who must—if the Institute is to remain viable—carry
part of the burden of running it?

The A.R.R.L., the R.S.G.B., the N.Z.A.R.T.—to mention but a few of
the better known national Amateur organisations—exist by virtue of their
local branches and clubs. Conceptually they are the co-ordinating bodies
which exist primarily to guide, foster and speak for the local "chapters."

Perhaps we would do well to consider the many advantages our
Institute now enjoys because of the existence of the local radio clubs
and how much greater these advantages might be if we actively sup-
ported the formation of more of them.

HAROLD L. HEPBURN, Federal Vice-President, W.I.A.

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Mullard TRANSMITTING VALVES FOR SSB

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LINEAR RF POWER AMPLIFIER SSB SUPPRESSED CARRIER SERVICE

Valve Type Number	V _a	I _a (a) mA	P (load) (driver) W	PEP (out) W
QV06-20	600	26	0.25	46
QV08-100	750	130	1.5	220
QV08-200	600	150	1.5	240
QV2-250C	2000	100	1.5	300
QY3-65	3000	15	1.0	130
QY3-125	3000	23	1.0	228
QY4-250	4000	50	1.0	454
YL1150	600	100	1.0	109

More detailed information on these valve types may be found in the Mullard Technical Handbook, Volume 3.

The following types are used extensively in SSB transceivers of American manufacture and are now available from Mullard for maintenance purposes—

6DQ5 6HF5 8236



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YL1150



QV2-250C

BARRY WOOTTEN,* VK3AK, and CYRIL MAUDE,† VK3ZCK

A NUMBER of articles dealing with the Pye Reporter Mk. 1 and Mk. 2 have been quite regular in appearance over the past months, and in collaboration with Cyril VK3ZCK, I hope to help those who either worked and altered their own units, or had someone else do it for them, or intend doing it in the near future to do a complete check of both tx and rx. Cyril will give details of the coils and component alterations, including a circuit diagram of the N5A test set.

MODIFICATIONS TO UNIT PRIOR TO TUNE UP

MODIFICATION TO COILS

- L1-6AK5 V1 Grid coil (53 Mc.), 11
turns, tap 21*
L2-6AK5 V1 Plate coil (53 Mc.), 7
turns.
L3-6AU6 V3 Grid coil (45 Mc.), 8
turns, tap 2-3†
L4-6AU6 V2 Plate coil (37 Mc.), 9
turns.
L5-6AU6 V4 Plate coil (12.5 Mc.), 12
turns.
L12-Antenna Link, unchanged.
L13-6J6 V10 Plate coil (53 Mc.), 11
turns.
L14-6J6 V10 Grid coil (53 Mc.), un-
changed.
L15-6AQ5 V11 Plate coil (53 Mc.), 5
turns.
L16-6AU6 V12 Plate coil (26 Mc.), 20
turns.

* Tap position can be varied if the need be to improve signal.

† Tap position should be varied as described under tuning up.

‡ In some sets this coil need only be 15 turns, but in all cases the fixed capacitor 5 pF. and any others across coil or from pin of V12 to earth should be removed, and all tuning done with an iron dust slug. The wire used in the coil should be of such a gauge that it just fills the space between the slugs.

Do not at this stage touch the neutralising capacitors.

MINOR CIRCUIT CHANGES NEEDED TO IMPROVE PERFORMANCE

V9 6AQ5, the receiver audio and modulator tube. The two cathode resistors, 470 ohms and 150 ohms, should be transposed so that the 150 ohms resistor is on the cathode and the 470 ohms goes to earth.

V11 6AQ5 doubler/driver. The 100K screen resistor can be reduced to 27K to improve drive to the p.a. tube.

The 220 ohms w.w. resistor on the cathode of V10 6J6 should not be altered as it provides protective bias to the tube.

* 8 McKenna St., Avondale Heights, Vic.
† 2 Clarendon St., Avondale Heights, Vic.

If it is necessary to replace the double button carbon mike with a single button type, the 25 μ F. 12v. condenser be shorted out and the mike connected between black and white leads.

One way of increasing the h.t. supply is to replace your 12 v. vibrator with a 6 v. version of the same type but connecting a 14 ohm w.w. resistor between the field pin and battery.

Another way of getting increased drive to the p.a. tube is to replace the 6AQ5 V11 with a 6DL5 adjusting the heater balance resistors accordingly. If increased r.f. output is required remove the 6J6 valve, the two neutralising condensers and the 7-pin socket, enlarge the hole to take a 9-pin ceramic or similar valve socket, connect L14 to pins 1 and 3 and L13 to pins 6 and 8, the heater lead is then connected to the centre tap (pin 9) and pins 4 and 5 are earthed. Connect the 220 ohm bias resistor to pin 2 and a 1500 ohm $\frac{1}{4}$ w. resistor to pin 7, and modulated h.f.

Plug in QQE02/5 adjust heater balance resistor accordingly. This will give about three times the r.f. output for the same d.c. input. The use of a QQE03/12 is not recommended as it places undue strain on the power supply.

V1 receiver r.f. amplifier tube can be replaced with the following tube without any circuit modification. M8100 a ruggedised version of the 6AK5 or the triode 6GK5 or 6FH5 which may require neutralising.

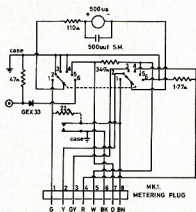


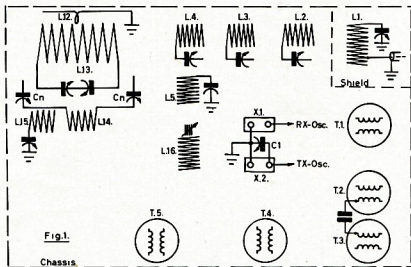
FIG.2. N5A WIRING DIAGRAM

- Switch positions:—
- 1—Receiver tune.
 - 2—Oscillator drive.
 - 3—N.C. Mk. 1.
 - 4—P.a. grid drive.
 - 5—P.a. plate current.
 - 6—Field strength meter.

ALIGNMENT OF RECEIVER

It is best before doing this to make these checks first.

1. Check the audio output of the rx. This is common practice, and numerous methods are used. After satisfying yourself that the audio is all right.
2. Check the 2nd i.f. strip. To do this touch the end of a screwdriver to



Coil Locations and modified winding data.

- L1-53 Mc., 11 turns.
L2-63 Mc., 7 turns.
L3-45 Mc., 8 turns.
L4-37.5 Mc., 9 turns.
L5-37.5 Mc., 12 turns.
L12-Link, unchanged.
L13-53 Mc., 11 turns.
L14-53 Mc., unchanged.
- L15-53 Mc., 5 turns.
L16-39 Mc., 29 turns.
X1-12.53 Mc., Rx Crystal.
X2-13.258 Mc., Tx Crystal.
C1-3.30 pF, zeroing trimmer.
CN-Neutralisation trimmer.
T1-1st i.f.t., 15.4 Mc.
T2-T3-2nd i.f.t., 2.9 Mc.

the grid of the 2nd mixer (V5 pin 2). This should produce reasonably loud clicks in the output. If nothing is there, check all valves in the i.f. section.

3. Check the 1st i.f. This is much the same as the former, the end of a screw-driver to the grid of the 1st mixer (V3 pin 2). Once again response should be noticed.

The equipment used in aligning the units will undoubtedly be varied, but if an accurate signal generator is available the better the results will be.

A multimeter is also required unless you can beg, borrow or steal an output meter whose load can be adjusted to 3-5 ohms.

Set the range of the multimeter to the lowest a.c. range (0-1 volt if yours goes that low) and connect across the voice coil of the speaker, taking care neither lead shorts to the frame, this will cause feedback in the rx and an audio spark will result.

Right, you have all these, here goes.

2nd I.F. ALIGNMENT

Feed the output of the signal generator (2.9 Mc.) via a 2200 pF. condenser to the grid of 2nd mixer (V5 pin 2). Check the frequency of the signal generator against a crystal marker oscillator. To produce a zero beat, loosely couple the oscillator to the grid of V5, turn off the modulation from the signal generator, and as you tune either side of 2.9 Mc. you will hear when zero is reached. Remove the marker oscillator and turn it off. Set the depth of modulation to 30% at 400 μ V. on the signal generator.

Turn volume control down as you increase output of generator. Align primaries and secondaries of T2, T3, T4 and T5 to resonate on 2.9 Mc. Maintain output from generator so the a.f. does not exceed 25 mW. (approx. 0.3v.).

Unscrew primary cores of T2, T3, T4 and T5 fully. Primary cores are on the underside of chassis.

Tune T5, T4, T3 and T2 secondaries (top slugs) in that order for maximum a.f. output, repeat, with reduced signal generator input to approx. 0.3 volt a.f. output.

Tune primary of T5, T4, T3 and T2 in that order for maximum output, keeping the output "constant" by reducing signal generator input.

Adjust signal generator output for 25 mW. (0.3 volt). Re-peak primary of T3 (top) for maximum output.

The sensitivity should be between 120-200 μ V. for an output of 25 mW. (0.3 volt).

Increase the signal generator output by 6 db. (X2) and detune the signal generator on either side of the carrier, until output reads 25 mW. (0.3 volt) again. This should be between 13 Kc. off tune. (13 Kc.-18 Kc. for 60 Kc. i.f., 26 Kc.-32 Kc. for 120 Kc. i.f.) Increase the output of the signal generator 60 db. (X 1000). Detune the signal generator, until 25 mW. (0.3 volt) is obtained, bandwidth should be 42-60 Kc., 84-120 Kc.

If re-adjustments are necessary, repeat operations as many times as is required to obtain correct results.

As quite a lot of the units will be a little worse for wear and if these re-

sults are not obtained, check the valves in the i.f. section for low emission, especially the 6AV6.

1st I.F. ALIGNMENT

Tune signal generator to the range covering up to 16 Mc. Feed the output via a 2200 pF. condenser to grid of V3 pin 2, adjust signal generator to crystal frequency = 2.9 Mc. = 15.433 Mc. Adjust top and bottom slugs in T1 for maximum a.f. output.

Some units have two Philips' trimmer condensers fitted. Tune the one nearest to L1 first. Re-check the adjustment of the signal generator, and adjust a.f. output to 25 mW. (0.3 volts). Sensitivity should be within range of 5-18 μ V.

A long process? Well, you are halfway there. This alignment is where the overall sensitivity comes from. Now on to the r.f. section.

R.F. SECTION

Care must be taken here as wrong peaks from the signal generator can be picked up. If you have a friend, whose unit is already converted, you will save some time. For those who have to do battle alone, these personal hints will help. This is where an accurate signal generator pays off.

Tune the signal generator to the required frequency 53 Mc. If you are using ordinary shielded cable, discard, and fit a length of 52 ohm co-axial RG58AU to the signal generator. Feed output of signal generator to antenna socket, and tune to maximum output. Check your modification again, also change-over relay. When all is O.K. and you have found that you made no mistakes, turn audio control flat out.

The friend with his unit can have first go. Depress the mic. p.t.t. switch (hoping he did not forget to use a dummy load on his tx), now adjust harmonic amplifier anode tuning (C9 across L3), here you should start to hear the tx. If necessary reduce audio and tell your friend to shift his tx further away, now tune mixer grid tuning (C10 L4). The noise from the tx should be getting quite loud now, so tune r.f. anode and r.f. grid tuning condensers (C7 L2 and C1 L1) and after replacing your speaker and output meter you can now do a final peak with the signal generator.

Let's go back to the lone battler. Right, tune output harmonic amplifier tuning (C9, L3) slowly and put your ear near the speaker, an audio note should be heard. If not, leave in about two-thirds mesh and adjust mixer grid (C10 L4), the audio should be quite noticeable here. If necessary reduce signal generator input and adjust r.f. grid tuning (C7 L1) together.

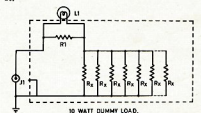
Now check tuning of signal generator and go over all condensers and peak to maximum a.f. output. Check tap on r.f. grid coil (L1) and after making sure the tap is optimum, and the frequency O.K., check the sensitivity. This should be between 1-3 μ V. If this is not so, check the peaking of the r.f. section, and the valves. An M8100 can replace V1 and you should reach the sensitivity figure.

The oscillator coil L5 can now be adjusted. This has little effect on overall gain. Some inform me that they cannot get a peak, don't worry, tune the slug in the coil, and if you notice an increase, good.

Well, that's the rx. A point I would like to mention here is that a lot of Hams have hotted up the power supply and shorted out the 15K w.w. h.t. dropping resistor to increase rx h.t. This is quite O.K., but the 6AK5 (V1) plate and screen volts should not exceed the limits. If it is necessary, increase the 15K R4 and 68K R3 V1 anode and screen resistors to maintain correct volts, about 120 volts on plate. If the M8100 is used this is most necessary. The M8100 is a premium quality 6AK5 and gives excellent results used here.

TRANSMITTER SECTION

This should present no problems, if the coil modifications as listed have been followed. Before we go any further, for those who are a little more ambitious than others, may I humbly recommend the building of the N5A, this might take up some time, but in the long run will be more than worth it.



- 30 ohm or 50 ohm feeder:
- R1-30 ohms 3 w.
- R2-150 ohms 1 w. carbon resistors (seven resistors).
- L1-12 volt 2 w. pea lamp.
- 75 ohm feeder:
- R1-75 ohms 3 w.
- R2-300 ohm 2 w. carbon resistors (six resistors).
- J1-Antenna connector.

Unit should be enclosed with connector at one end and lamp at the other. Case should be earthed to connector as shown.

If you wish, a multimeter can be used. I will list typical readings with the N5A as well as a multimeter.

Those with the multimeter can either use the metering socket and earth or take their reading direct to the metering points.

Position 2, oscillator drive. This is measured at the junction of R54 (100K) and R56 (1K) in multi grid circuit. The reading should be approximately 60-80 μ A. on N5A and 100 μ A. on multimeter.

Position 4, multiplier drive. This is measured at junction of 680 ohm and 7.5 ohm w.w. in grid circuit. Reading approx. 100-120 μ A., and 50 μ A.

Position 5. This reads p.a. plate current measured across R42 (10 ohms). Reading approx. 100 μ A. and 700 μ A.

A dummy load should be used on the output. I have included a circuit and description of a unit that is quite OK to use. In fact, it is a copy of a commercial unit.

With the dummy load in place, press the mic. p.t.t. switch. Now tune L16,

(Continued on Page 23)

A LOW COST TILTABLE MAST AND TOWER

P. E. PLAYSTED,* VK3APH

IN these days of low sunspot activity a rotatable array on the DX bands becomes very desirable. The principal objections the average Amateur has to getting a rotatable array up are probably: 1, cost; 2, reluctance to make the necessary numerous antenna adjustments at a dangerous height above terra firma.

The mast and tower described attempts to overcome these objections. The cost in materials was approximately £15, to which should be added the fee for hiring a 150 amp. arc welder, welding rods and a few other sundries.

The illustration should make the design details fairly clear, and the author would be happy to answer any queries relating to its construction.

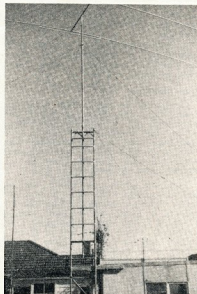
Do not let the arc welding involved discourage you, firstly obtain an instruction book (5/- from most suppliers of welding gear) and get a thorough understanding of the basics, then spend an hour or so practising on odd pieces of pipe, etc. You will soon become proficient.

Materials required for mast and tower:

- 3 lengths of $1\frac{1}{2}$ " water pipe (medium gauge).
- 1 length of $\frac{1}{2}$ " water pipe (medium gauge).
- 4 feet of 2" water pipe.
- 5 feet of $1\frac{1}{2}$ " x $\frac{1}{4}$ " angle iron.
- Sundries.

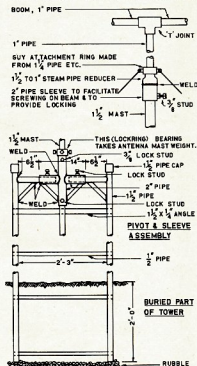
* 34 Jordon Gr., Glen Waverley, Vic.

It was decided to top the mast with a two element yagi using the popular plumbers' delight type of construction. The array is 36 feet in height and when tilted over comes down to within 6 feet of ground, making the inevitable adjustments and modifications a



very simple matter indeed, compared to working at the top of even a collapsed telescopic tower.

For those who may be interested in the 20 metre yagi used, the boom consists of 1 in. water pipe with a centre T joint and 2 feet of 1 in. electrical seamless conduit butt-welded to the ends of the boom to support the elements. The elements are constructed from 2 lengths (16 ft.) 1 in. o.d. dural



VK3APH TILT-OVER MAST & TOWER

tubing, 3 lengths (16 ft.) $\frac{3}{8}$ in. o.d. tubing at a cost of approx. £7/10/- for the dural. The elements were cut for 14.2 Mc., i.e., director 32 feet, driver element 34 feet and spacing of 0.1 wavelength.

Total beam weight including 5 feet of 1 in. water pipe mast is 40 lb. At present, the array is fed with 600 ohm line with a quarter wavelength matching transformer to a T match, and providing many enjoyable QSO's with local and overseas Hams.



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TWO-BAND V.H.F. CONVERTER

ROY F. LESTER,* VK2ZRL

THIS converter is the result of efforts to overcome some of the problems peculiar to v.h.f. mobile operation in the Sydney and South Coast area of VK2.

Basically the problem was:

- (a) to operate 6 and 2 m. mobile with easy band changing;
- (b) to operate on 2 m. without Channel 5A Wollongong occupying most of the bottom megacycle of the band.

I had been fortunate enough to acquire a 46 Mcs. crystal. Used in a six metre converter to tune 52 to 54 Mcs., this gives a tunable i.f. of 6 to 8 Mcs. It occurred to me that I could also use the first harmonic of the xtal osc. (92 Mcs.) in a two metre converter, tuning 144 to 146 Mcs., the i.f. in this case being 52 to 54 Mcs. By feeding the output of the 2 mx converter into the 6 mx converter I would then have double conversion on 2 mx. This double conversion would, I thought, help to keep out the interference from Chan. 5A.

After a little experimentation, the circuit shown here was decided upon, and has proved to be a fine mobile converter.

The 6 mx converter consists of a 6EJ7 r.f. amplifier, 6BL8 mixer and cathode follower, and half 12AT7 as a

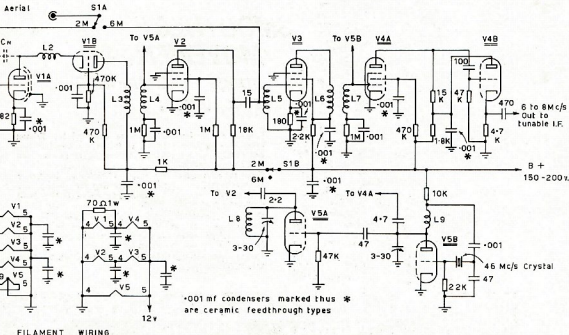
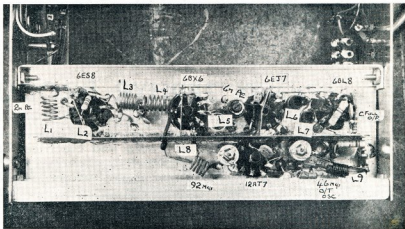
Robert Dollar type xtal osc. On 2 mx a 6ES8 is used as a cascode r.f. amp., 6BX6 mixer and the other half 12AT7 is a doubler. The block diagram shows the general arrangement. Tube types may be varied to suit your junk box or favourite circuit.

The 6EJ7 6 mx r.f. amp. is an excellent valve, but as it has quite high gain, proper attention must be paid to by-passing and shielding. (Other suitable valves would be 6AK5, 6CB6, 7

pin, 6BX6, 6EH7, 9 pin, but if using any of these types don't forget to add a suitable screen resistor and by-pass.)

It will be noticed that no h.t. is applied to the 12AT7 doubler stage. This stage is used as a form of diode multiplier and will give all the injection needed.

I did not find it necessary to neutralise the 6ES8, but if required Ln and Cn, shown dotted in diagram, may be added.



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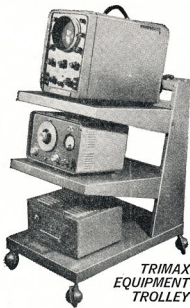
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My converter was built on a piece of tinplate 9 in. x 3 in. and the layout and shielding can be seen in the photographs and layout diagram. Use was made throughout of ceramic feed-through condensers so that de-coupling resistors, cathode resistors, etc., could be mounted above the chassis, thereby saving space below.

No detailed construction notes have been given here as I think most Amateurs have their own ideas. The photos and diagrams show the parts layout quite well and reference to recent articles in "A.R.," "QST," etc., will help those who are unfamiliar with v.h.f. techniques.

To tune up the converter, first apply h.t. and switch the band-switch to 6 mx. Adjust the overtone osc. trimmer for proper overtone operation, then the 6 mx coils may be peaked for flat response over the band. Now turn the band-switch to 2 mx, peak the 92 Mcs. trimmer for max. injection, and adjust 2 mx coils for flat response from 144 to 146 Mcs, best signal-to-noise ratio, etc. If g.d.o. is available, check the frequency of all coils before applying h.t. The overtone osc. coil should resonate at a frequency a little higher than the crystal frequencies.

A 52 Mcs. coil was originally wired into the 2 mx mixer plate circuit, but it proved to be very sharp and had a damping effect on the 6 mx aerial coil when tuned spot-on. It has been removed and replaced with a resistor and a small condenser coupling to the 6 mx aerial coil. As there is plenty of gain in the following sections, this worked out very satisfactorily.

Band-changing switches the aerial to the appropriate converter and applies h.t. to the 2 mx r.f. amp. and mixer when on 2 mx. For most of my mobile work I use only one aerial. This is a quarter wave-length on 6 mx, used as a three-quarter wave-length on 2 mx.

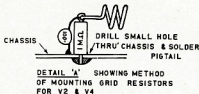
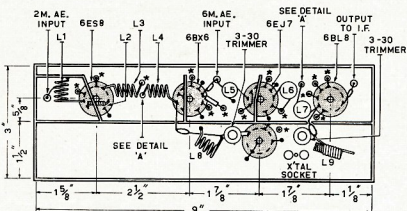
COIL DATA

- L1—7 turns $\frac{3}{8}$ " diam., tap at 4 t., 20 g.
- L2—10 turns $\frac{1}{4}$ " diam., 26 g.
- L3—12 turns " diam., 26 g.
- L4—6 turns $\frac{3}{8}$ " diam., 20 g.
- L5—5 turns $\frac{3}{8}$ " diam., 20 g.
- L6—8 turns $\frac{1}{4}$ " slug, tuned former, tapped at 3 turns, 26 g. enam.
- L7—9 turns $\frac{1}{4}$ " slug, tuned former, 26 g. enam.
- L8—8 turns $\frac{1}{4}$ " slug, tuned former, 26 g. enam.
- L9—4 turns $\frac{3}{8}$ " diam., 20 g.
- L9—9 turns close wound on $\frac{1}{4}$ " ferrite slug taken from t.v. i.f. type former.

In operation this converter has proved to be almost free from spurious beats and adjacent channel interference. When operating in high signal strength areas close to Chan. 5A there is still some 5A in the first 100 Kcs. of the band, but none elsewhere and no "birdies" are evident.

Another possibility with this type of circuit would be to use a 47 Mcs. xtal. 50 to 54 Mcs. would then tune from 3 to 7 Mcs. The injection to the 2 mx mixer would be 94 Mcs. (2 x xtal freq.) and the output from the 2 mx section would be 50 to 54 Mcs.

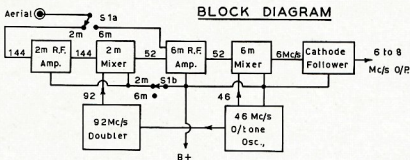
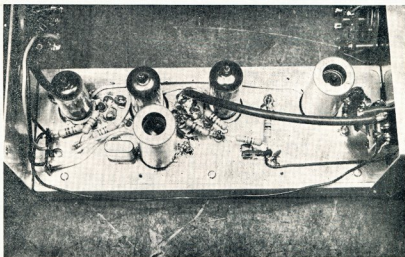
My thanks to Gordon Aiton for the excellent photographs.



2 BAND V.H.F. CONVERTER

Shielded compartments made from light gauge tinplate, brass or copper (not aluminium) and soldered to chassis (ditto, heavier gauge). Before fitting, drill holes to take L2 & for leads from osc. section to mixer grids. Leads shown thus \rightarrow , soldered to chassis. Components marked * are .001 mfd. feedthrough condensers.

Layout diag., underneath view.



A SILENCER FOR P.E. CHARGER UNIT

E. C. MANIFOLD,* VK3EM

HAVING procured an "outboard marine" P.E. charger plant for W.I.C.E.N. and other purposes, it was found that the original silencer was far from satisfactory for our requirements. In fact, it just about sent us "up the wall" with the sharp explosive exhaust noise.

Even when a 30 ft. extension lead was obtained, the noise still was penetrating enough to be annoying, and this meant that something had to be done before it was required for any other exercise.

A few minutes with a pencil gave rough outline of what would be necessary for a start, and from there it would be a bit of "cut and try."

Rough reckoning indicated that in size it would have to be near to the capacity of the cylinder and a little more if possible, but as the space available is limited, without spreading out past the rest of the unit, it meant that the silencer would have to be turned to the vertical plane.

This has been done and reference to the drawings will show the sizes and positions of the various pieces.

The outer case slips down over the drilled pipe, and the $\frac{1}{4}$ in. bolt drops through the top hole and screws down into the plugged end of the pipe. The plug was made from a piece of mild steel rod turned down to size and drilled, then tapped to take a $\frac{1}{4}$ in. Whit. thread bolt.

For obvious reasons $\frac{3}{4}$ in. B.S. pipe has been used for the inside section, firstly the pipe was available, also the $\frac{3}{4}$ in. B.S.P. elbow, and lastly so were the pipe threading dies—obviously the choice.

This quite apart from the fact that the outlet of the unit's exhaust (original system) is screwed for $\frac{3}{4}$ in. B.S. pipe.

After construction of the various parts, assemble them in the following order, first obtain some graphite grease, and paint the threaded end (of the short elbow pipe end) before screwing into the exhaust port from the engine, to ensure that if necessary it can be removed when service to the engine is required, but don't tighten too tight.

Then paint the end of the drilled pipe and screw into the elbow, after which the other case can be dropped into position and the holding bolt graphited and tightened down firmly but not to an excessive amount (remembering that at some time service will be required) and tightening things too much with the heat and corrosion from the engine usage will make it a hard job to remove.

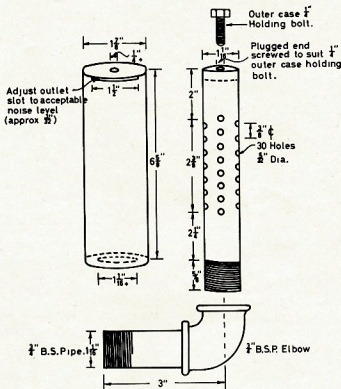
Finally, with the engine running, adjust the size of the exhaust slot at the top of the outer case to give a noise

more like a "choof" rather than the explosive "crack" of the original "pong box."

There have been three of these made and fitted to date with complete satisfaction, as the main noise now is engine noise, and moving away from the unit approximately 20 feet, no direct exhaust noise can be heard, only

the engine and the generator whine, which are quite acceptable while copying signals from the radio gear.

Note.—Outboard marine engines and Johnson Chore Horse are similar. With Briggs & Stratton engines a modified installation may be required, but the silencer would be satisfactory for engines in the $\frac{1}{2}$ to $\frac{3}{4}$ h.p. group.



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A TRANSISTOR TRANSCEIVER FOR 144 Mc.

HARRY BURTON, ZL2APC

WHEN I decided to go to the 1964 Convention at Christchurch, it seemed that with no vehicle in which to transport any gear I would be unable to announce my presence in Christchurch to those v.h.f. operators I had worked from Wellington. After some cogitation the idea dawned of constructing a hand-held transistorised transceiver for 144 Mcs.

Various periodicals such as "QST" were consulted to ascertain the state of the art in such devices, but much information was found on transistorised gear for that band. However, the designs available were useful guides. The next thing considered was the availability of suitable low-priced transistors. Type AF102, manufactured by Mullard, was found to be available at a reasonable price. The manufacturer's data claims that this type of

This article was originally published in "Break-In" during January and February. The author has since made modifications to suit Australian conditions. It is the modified version now published.

they are probably available on the Australian market, and also from firms such as Texas Crystals Inc. of U.S.A. if the necessary dollars can be found. My crystal came from the latter source.

The choke CH1 is necessary to ensure that the crystal oscillates on its 5th overtone as intended. This choke, together with the stray capacitance of the crystal holder, should resonate at

about 2 Mcs. above the operating frequency of the crystal, thereby presenting a high parallel impedance at that frequency. At other frequencies the crystal will be shunted by a low impedance and this will prevent oscillation on the fundamental or other frequencies. My crystal exhibited a tendency to oscillate on any frequency except the correct one until this choke was added.

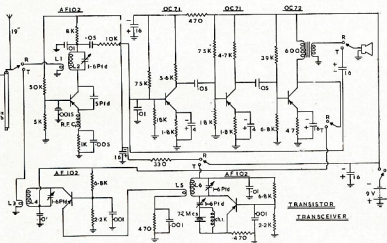
The series trimmer coupling the crystal to the collector controls the feedback and should be adjusted to the minimum value which gives reliable starting of the crystal controlled oscillation.

The doubler final operates in the common or grounded base mode, equivalent to grounded grid in vacuum tube circuits. A link couples the emitter of the final to the oscillator tank, and the resistor-capacitor combination between the cold end of the link and earth seems necessary to give good frequency multiplying efficiency. Some forward d.c. bias is applied to the base of the final. The tank circuit in the collector of the final is link coupled to the aerial via the transmit/receive switch.

To avoid radiation of unwanted signals on 72, 216 and 288 Mcs., a shorted quarter-wave co-axial stub is connected across the feed point at the base of the whip aerial. This stub will present a very high parallel impedance at the frequency for which it is cut, i.e., 144 Mcs., and a low shunt impedance at 72, 216 and 288 Mcs. to attenuate these frequencies. The length of the stub is 13 1/2 inches as approximated for solid dielectric co-axial, but the length should be adjusted for minimum reduction of the output at 144 Mcs.

THE RECEIVER

The receiver makes use of a super regenerative detector for the maximum

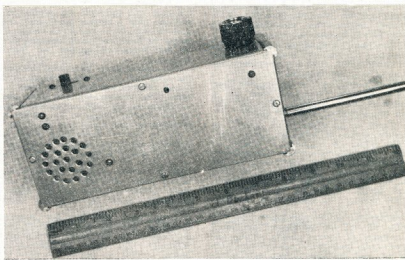


transistor has a gain of 13 db. as an amplifier at 200 Mcs. It appears to be very suitable for use on two metres. Three such transistors are used, one in the receiver and two in the transmitter. Three audio transmitters are required, two OC71s and one OC72, making a total of six transistors in the complete unit. The operating controls are reduced to the minimum, an on/off switch and a transmit/receive switch. The input to the final is approximately 30 milliwatts.

THE TRANSMITTER

The transmitter is quite simple, although crystal controlled. It comprises a crystal oscillator on 72 Mcs. followed by a doubler. The doubler final is collector modulated in an analogous fashion to plate modulation of a vacuum tube final. The purists may shudder at the modulation of a frequency multiplier, but let them shudder.

The 72 Mcs. crystals may not be found in everybody's junk box, but



of efficiency consistent with simplicity and low cost. Before decrying the use of such an elementary receiver, it should be remembered that there is not much point in hearing what you cannot work as could be the case with the combination of a better receiver and a few milliwatts of transmitter power such as is used here. The ranges of receiver and transmitter as described appear to be roughly compatible. Most work with the unit has been done to fixed stations running considerably greater power and equipped with beams and good receivers.

No super regeneration control is shown. A 50K potentiometer in series with the 50K resistor forming part of the base bias network of the AF102 could be tried as a regeneration control. The 5 pF. capacitor coupling collector and emitter, and the emitter r.f. choke are variables to experiment with if good super regeneration proves difficult with certain transistors.

The 8K resistor in series with the collector tank is the load resistor across which the audio voltage is developed. The 0.01 μ F. bypass may seem large, but is designed to bypass the quench frequency voltage to prevent it overdriving the audio section. A 10K resistor in series with the 0.05 μ F. coupling capacitor and a further 0.01 μ F. bypass to earth at the base of the first audio transistor are further elements in the quench frequency filtering.

No external tuning control is fitted, but the co-axial trimmer used for receiver tuning may be reached by a screwdriver inserted through a hole in one of the panels of the case. My unit was peaked on 144.2 Mcs. and has received stations anywhere in the first megacycle of the band without retuning.

If optimum receiver performance is required it is suggested that an external regeneration control and an external tuning control both be incorporated.

AUDIO SECTION

This section is quite straightforward. Two cascaded OC71 voltage amplifiers drive an OC72 as a class A audio output stage on receive, and as a Heising modulator on transmit with the OC72 output transformer operating as a modulation choke.

The time constants of the interstage coupling circuits may seem unusual for transistors, but good low frequency response was not required.

A ZC1 moving coil earpiece is used as a speaker on receive and as a microphone on transmit. This unit has an impedance of about 60 ohms.

There is no audio gain control on either receive or transmit. These facilities could be provided if desired at the complication of the transmit/receive switching. A spare pole of the transmit/receive switch could be used to select one or the other of two pre-set potentiometers of the solder-in type arranged at the input to the first OC71.

Since the OC72 modulator draws 10 mA, it is by far the biggest individual consumer of battery power. Some experiments have been carried out with a form of amplifier known as sliding-

bias class A. In this type of amplifier the forward bias on a transistor is arranged to increase with the signal to increase the current flow through the transistor. Some economy of power consumption is achieved at the price of more complication and higher distortion. This system has not been adopted in the present unit.

MECHANICAL CONSTRUCTION

For the actual wiring assembly, use is made of material known as Vero Board. This material comprises a phenolic board about 1-16 in. in thickness upon one side of which are parallel strips of copper each 3-32 in. wide and spaced apart by 3-32 in. Every 3-16 in. along the copper strips a hole is pierced through both copper and phenolic board. This material is a do-it-yourself printed wiring substitute. I used a piece of board 5 in. by 2 1/2 in. with the copper strips running horizontally across the smaller dimension. To use, proceed as follows:

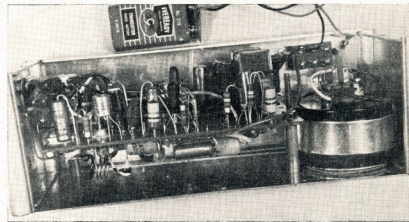
Let the top strip be an earth strip or rail. Allocate the next strip down the board to be a main h.t. or supply

copper strips are. This keeps them away from most of the components which are on the upper side of the board.

The case has the dimensions 7 1/4" by 3" wide and 2 1/4" deep. This is larger than necessary but gives adequate room for all components without cramming. The corners are made from material in the Widney Dorlec range of constructional material. This material comprises an aluminium alloy rod 13-32" in diameter with two longitudinal slots at 90°. These slots are of a width to accept 20 gauge aluminium sheet as a sliding fit.

The two sides and the two ends of the case have at each end of their lengths a portion which fits in the slots of the rods. Each side-piece and each end-piece of the case has a 1/4" fold-over top and bottom. The top and bottom panels are held in position by P.K. screws into the fold-overs. These P.K. screws hold the whole assembly together.

When the top and bottom panels are removed it is possible to withdraw the corner rods if desired. The catalogue



rail. The next strip will be decoupled h.t., the next the collector rail, the next the base rail, the next the emitter rail, and the next a further earth rail. The pattern will then repeat. A length of copper strip on each rail including four or five holes will suffice for wiring each stage.

The copper strip is severed between the next two holes with a sharp knife on all rails except earth and main h.t. rails. This technique allows more than one stage to be built across the width of the board. There is no point in breaking up the earth and h.t. rails.

As the pattern is repeated down the board all earth rails should be jumpered together and bonded to the case. The latter may be accomplished by using long 1/4" screws passing through enlarged holes in the earth rails and metal spacers for mounting the phenolic board on one of the panels of the case.

Components such as the trimmer capacitors and the crystal socket may be mounted on the board with a little ingenuity. All coils are under the board, that is on the side where the

number of the rod is DL222 in the Midget range.

The all-up weight of the unit, including battery, is 1 1/4 lb.

MISCELLANEOUS

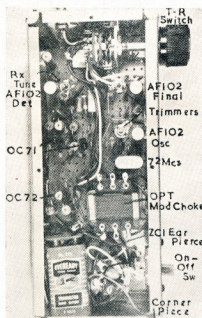
The transmit/receive switch requires a four-pole two-position switch. I used a six-pole two-position wafer switch of Japanese manufacture, two poles being spare. One pole is used for aerial changeover from the receiver to the transmitter. A second pole removes h.t. from the super regenerative detector and applies h.t. to the crystal oscillator. A third pole couples the h.t. feed point of the final to the collector of the OC72 on transmit. A fourth pole disconnects the ZC1 earpiece from the secondary of the OC72 output transformer, allowing the latter to function as a modulation choke, and connects the earpiece to the base of the first OC71 via an isolating capacitor.

Since the impedance of a ZC1 earpiece is nominally 60 ohms, no input transformer is required to match it to

the base of the OC71 in order to achieve a good level of modulation. The output transformer originally used a push-pull OC72 to 3 ohm voice coil type with only one half of the primary used. This gave a bad mismatch on receive and the transformer was subsequently dismantled and rewound with a turns ratio of about 3 to 1. This gives an impedance ratio of 9 to 1 and therefore the ZC1 earpiece should present a transformed impedance of around 500 to 600 ohms at the collector of the OC72.

An alternative solution to rewinding a transformer would be to use a standard OC72 to voice coil transformer, a midset 3 ohm speaker instead of the ZC1 earpiece, and a further transformer to step up the impedance of the speaker when serving as a microphone to match it to the base of the first OC71.

The power source is the standard 9 volt transistor battery type 216. With a current drain of 15 mA. on receive and 23 mA. on transmit, these batteries do not last very long.



For the aerial a Japanese replacement whip is used which extends to a little more than the desired quarter wavelength of 19". A simple slide switch is used for on/off. The OC72 output transformer used has a core section of $\frac{1}{4}$ " by 5-16" with a winding length of $\frac{1}{4}$ ". In its rewound form there are 375 turns on the primary and 120 turns on the secondary of 32 s.w.g. enamelled wire.

The tuning capacitors are Philips tubular trimmers with ceramic insulation. The electrolytic capacitors may be 12.5 volt or 16 volt working. The paper and ceramic capacitors may be low voltage types.

Construction Hints. Do not overheat any of the components, particularly the transistors when soldering them in

position. Soldering to the Vero Board is easy with a clean hot iron. One tip for working on transistor equipment. When soldering, always have the piece of gear isolated from earth wires or leads such as those from test equipment, since small leakage currents flowing from or to your soldering iron through a transistor can ruin it as you solder it in position.

Beware of injecting too much energy into transistor circuits from a closely coupled grid dip oscillator. Tuned circuits with transistors connected often exhibit poor dips when checked with a g.d.o. This is because the transistors are not "dead" like cold valves and conduct on the potentials induced from the g.d.o. The poor dips encourage tight coupling, sometimes with unfortunate results.

ADJUSTMENT

Adjustment of the receiver to the desired part of the band is simple and obvious. If super regeneration is not readily achieved, a little judicious fiddling with valves may be required as suggested earlier. Perhaps another transistor could be tried.

The transmitter adjustment on my unit was done by listening for the second harmonic of the crystal oscillator on the 144 Mcs. receiver and adjusting the two trimmers in the oscillator for

8236 POWER PENTODE FOR S.S.B. TRANSCEIVERS

The demand for a higher power output replacement for the 6DQ5 is catered for by the 8236. For initial equipment, however, the Mullard preferred range of s.s.b. valves is recommended. Readers are referred to the table in Outlook, Vol. 5, No. 5, page 52, which shows the Mullard range of s.s.b. valves and to which the YLI150 is the latest addition.

Comprehensive technical information on s.s.b. transmitting valves may be found in Volume 3 of the Mullard Technical Handbook.

The 8236 is a high pervance, high dissipation, beam power valve which is rated and tested for use as an r.f. power amplifier. It may also be used as a series regulator and as a general purpose power valve. In most cases the 8236 will function as a high dissipation, direct plug-in replacement for the 6DQ5. In r.f. service up to 30 Mcs. the 8236 will handle 200 w. input and deliver 141 w. to the load. Because of its high pervance design, these conditions can be obtained at the relatively low anode voltage of 900 V. Its carbon anode and hard glass envelope permit continuous operation at 50 w. anode dissipation.

The 8236 is available from stock and tentative data are given below:—

TENTATIVE DATA 8236 POWER PENTODE

(Linear r.f. power amplifier in Class "AB1" s.s.b. Service with suppressed carrier.)

Maximum Ratings: Absolute maximum system for frequencies up to 30 Mcs.:

Anode voltage	1400 V DC
Grid No. 2 voltage	250 V DC

good output as seen on the receiver "S" meter or magic eye, and consistent starting of the oscillator. The final was peaked up with the whip extended, also by the use of a receiver equipped with a signal strength indicator.

COIL DATA

- L1—1 turn, 7-16" diam.
- L2—2 turns, 7-16" diam.
- L3—2 turns, 7-16" diam.
- L4—3 turns, 7-16" diam.
- L5—2 turns, 7-16" diam.
- L6—7 turns, 7-16" diam.

All coils are air wound with 22 s.w.g. RFC1—30 turns to fill $\frac{1}{4}$ watt resistor. CH1—18 turns to fill $\frac{1}{4}$ watt resistor. Prune to resonate with crystal holder at 74 Mcs.

RESULTS

The performance has exceeded expectations. Best two-way contact using the whip aerial was from the Port Hills, Christchurch, to Ashburton—a distance of approximately 50 miles. The signal report from Barry ZL3AR was readability 5 and strength 4. I have a QSL for the contact to show unbelievers.

REFERENCES

- "QST," February 1960, page 20.
- "QST," June 1963, page 44.
- "QST," March 1964, page 57.
- "Electronics World," November 1962, page 39.
- "Wireless World," May 1962, page 241.

Grid No. 1 voltage	—150 V	DC
Anode current	300 mA	DC*
Anode dissipation	60 W	
Grid No. 2 dissipation	3.2 W	
Bulb temperature	250 °C	
Maximum Grid No. 1 circuit resistance	30 kΩ	

Typical operation with two-tone modulation:

Frequency	30 Mcs.	
Anode voltage	1000 V	DC
Grid No. 2 voltage ¹	180 V	DC
Grid No. 1 voltage	—66 V	DC
Zero signal anode current	25 mA	DC
Zero signal Grid No. 2 current	1.0 mA	DC
Effective r.f. load resistance	2.8 kΩ	
Maximum signal peak r.f. grid voltage ²	66 V	
Anode current	170 mA	DC*
Average anode current	118 mA	DC
Grid No. 2 current	5.0 mA	DC*
Average Grid No. 2 current	2.5 mA	DC
Average Grid No. 1 current ¹	0.01 mA	DC
Power Output	115 W*	
Average Power output	57.5 W	
3rd Order Intermodulation Products ³	—25 db	
5th Order Intermodulation Products ³	—33 db	

* At peak of envelope.

¹ Preferably obtained from a well-regulated source.

² Preferably obtained from a separate, well-regulated source.

The peak grid voltage should be equal to the D.C. grid voltage.

³ This value is the approximate grid No. 1 current due to initial electron velocity effects when the grid is driven to zero volts at maximum signal.

⁴ Referenced to either of the two tones and without the use of feedback to improve linearity.

NEW CALL SIGNS

JULY, 1965

VK2FV—R. M. Marsden, Station: 11 Trafalgar Road, Turross Heads; Postal: 43 Houston Road, Kingsford.
VK2FP—M. D. Legg, 144 Kendal Street, Cowra.
VK3WP—W. H. Jones, 51 Canonbury Grove West, Bexley North.
VK3ADJ—E. W. Jinks, 1 South Street, Broken Hill.
VK3AFI—P. E. Stayte, 3/71 Evaline Street, Camperdown.
VK3AHC—D. Chitt, Flat 1, The Swifts, 66 Bower Street, Manly.
VK3APG—F. W. Fowler, Station: 38 West Street, Fivedock; Postal: P.O. Box 50, Brickfield Hill.
VK3ZAF—J. L. Harrison, 20 Bishop Avenue, West Pennant Hills.
VK3ZGW—G. L. S. Wilson, 31 Ada Street, Katoomba.
VK3ZHE—R. G. Friend, 7/22 Beauchamp Street, Marrickville.

VK2ZF—P. J. Fackender, Kanahooka Road, Dapto.
VK3ZK—J. T. Kalopedis, 24 Walton Street, Blakehurst.
VK3ZQM—G. V. Comber, Station: 94 Onslow Street, Ross Bay; Postal: Yellow Cabs Co., Darlinghurst.
VK3ZQT—A. F. Butler, 127 Manchester Road, Gymea.
VK3ZTE—R. A. Adams, 37 Bardwell Road, Bardwell Park.
VK3ZUB—B. Unsworth, Wyee State Mines, C/o P.O., Doyalson.
VK3ZTC—Sydney Teachers' College Radio Club, Sydney University Grounds, Newtown.
VK3ZED—T. D. Downie, 38 Broad Street, Croydon Park.
VK3DA—A. Davis, 19 Hovea Street, O'Connor, A.C.T.
VK3IV—V. F. Burman, 10 Dawson Street, Curtin, A.C.T.
VK3AT—D. G. Hallam, C/o O.T.C. Radio Station, Flakville, via Ballan.
VK3AEJ—G. W. Brain, Federal Street, Rainbow.
VK3AZH—K. J. Horsfall, 76 North Road, Reservoir.
VK3AZN—Z. H. Vandervan, 43 Clow Street, Flat 4, Dandenong.
VK3ZT—R. L. Head, Box 50, Mundara, Seymour.
VK3ZIV—H. C. Allan, 21 Leonard Street, Heidelberg.
VK3ZKU—D. N. Mew, Bamawa, via Rochester.
VK3ZOO—D. L. Godfrey, 10 Alexandra Avenue, Moe.
VK3ZPX—R. K. N. Wilkins, 118 Mont Albert Road, Caringbah, E.T.
VK3ZQB—D. C. Baxter, "Hildathorpe," Clarke Road, Pearcevale.
VK3ZRE—J. L. Gardiner, 10 Lingwell Road, East Hawthorn.
VK3ZTH—J. T. Higson, 34 Stapley Crescent, Chadstone.
VK3ZV—R. F. Fenner, 9 Chestnut Street, Carnegie.
VK4AI—A. E. W. Williams, Flat 2, 29 Gregory Street, Clayfield.

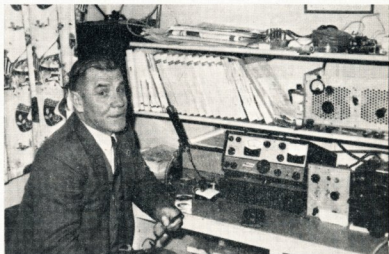
VK4DV—M. T. Deakin, 17 Nelson Street, Wulguru, Townsville.
VK4LS—J. B. Simpson, 414 Wynnum Road, Wynnum.
VK4NP—N. F. Wilson, 111 Richmond Street, Gordon Park.
VK4OG—R. E. Gunnourie, 34 Gregory Street, Toowoomba.
VK4YY—G. R. Crosier, 48 Algoori Street, Morningside.
VK4ZWM—W. McGowan, 66 Alderson Street, Newmarket.
VK5IL—B. G. Bell, 8 Flower Street, Elizabeth Downs.
VK5LW—J. R. Godson, Station: Block No. 6 Kroen's Landing, Walkers Flat; Postal: 53a May Terrace, Ottaway.
VK5XF—R. A. Ford, 27 Dunnington Road, Elizabeth North.
VK5ZPD—P. L. A. Burton, 85 North Terrace, Coleridge Park.
VK5ZQB—H. Dittloff, 12 Essex Avenue, Clovelly Park.
VK5EP—D. J. Fennell, 72 Hare Street, Kalgoolie.
VK6XY—A. M. Keightley, Johnston Street, Wickiepie.
VK6ZDR—R. C. Speer, Station: Warburton Road, Bridgetown; Postal: P.O. Box 71, Bridgetown.
VK6ZER—M. G. Shooter, C/o Agricultural High School, Narragin.
VK6ZFD—J. C. Goulet, 45 Powell Street, Joon-danna.
VK7FR—F. A. C. Richards, 170 Westbury Road, Launceston.
VK7ZMC—M. C. Hooper, 182 Melville Street, Hobart.
VK9JO—J. F. O'Toole, C/o O.T.C. Cable Stn., Cocos (Keeling) Is.

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All v.h.f. operators are invited to participate.

SIDEBAND SKETCHES

DUDLEY NOURSE, VK2DQ



On obtaining the graven image of "The Voice of the Ramparts of Democracy," alias VK2 Delightful Quality of Broken Hill, it was considered appropriate to commence this series.
As a pre-war exponent of the "pump-handle" method of communication, which he continued for the R.A.A.F. for some years (note that the said handle is still visible in the photograph), Dudley's tracks were traversed by a quacking duck over 10 years ago, when he became a foundation member of the 80 metre "Sewing Circle," still apparent at the top end of the band.

Although a keen do-it-yourself man, Dud. has put aside phasing networks, mechanicals and McCoys, and emptied the shack "ginger jar" to buy a Swan, which gives him time on the air plus enough to experiment with his Deltabot.

The 3DQ log records details of experiments, conversations and data, all in shorthand—quite the most comprehensive in VK, I should imagine.

Dud. was behind the scenes for the May, 1964, Sidebanders' Convention at Hamilton,

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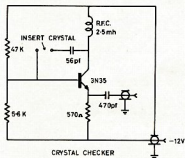
A TRANSISTOR CRYSTAL CHECKER

T. MITCHELL,* VK5TH

THE Crystal Checker illustrated was intended as a go/no-go and frequency measuring device and was not designed to be used as an activity tester. Oscillation can quickly be checked by feeding into a c.r.o. with a reasonable high frequency Y amp. response. Output is sufficient to trigger a Hewlett Packard frequency counter.

The device is an invaluable aid for crystal grinding. The crystal plug-in connections on the tube bases are arranged so that almost any crystal will plug in-circuit in any orientation. The extra capacity introduced should not affect accuracy for practical Amateur applications.

The battery pack consists of nine nickel-cadmium 50 mAH. cells inserted in a patent drug phial with a B. & C. co-axial connector. These cells are available at about six shillings each and if charged carefully should last some years.



CRYSTAL CHECKER

The transistor, a 3N35, is a v.h.f. tetrode (silicon NPN) extracted from disposals equipment and used as a triode in a Pierce type circuit. Simple "rule of thumb" calculations suggested by the Mullard "Reference Manual of Transistor Circuits" resulted in a collector current of 1 mA. Output from the emitter into a high impedance c.r.o. varies from 100 to 500 millivolts, depending on crystal activity and c.r.o. Y amp. frequency response.

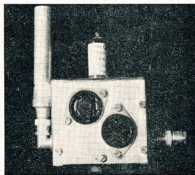
The circuit is not the ultimate in design but a practical arrangement requiring minimum components. Note the absence of a tuned circuit.

I have used this circuit with various transistors in two Amateur band converters and a 1 Mc. oscillator for a projected Deltahet type receiver. No trouble has been experienced with harmonic or unwanted oscillations, although I concede their presence is likely.

* 11 Station Place, Alberton, South Aus.

Although no meter is yet incorporated, the following figures are submitted. A 0-500 μ A. meter was inserted directly in the base of the transistor. The no-signal base current was 15 μ A.

Crystal freq. Kc.	Base Current μ A.	Type of Crystal
22,000	170	Miniature sealed can
15,407	120	Vacuum Sealed
8,902	260	
8,646	255	
8,327	240	
8,327	240	
8,327	240	
7,406	240	
7,406	240	
7,406	240	
8,332	240	
8,332	100	DC11
8,332	80	
7,610	240	
7,610	230	
2,853	40	
2,460	80	

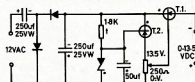


I would suggest that the best approach for anyone wishing to build a similar checker for use as an activity tester would be to use any low power transistor classified as v.h.f. and incorporate a meter. Noting the tendency of base current to rise with frequency, calibrate against a commercial crystal activity tester using vacuum sealed crystals as standards.

An Economical Transistor Power Supply

This very useful little power supply was built in about an hour to run a transistorised transmitter (on 2 mx f.m.) that was rather expensive to run on dry cells. Cost of components as purchased is about four or five sets of batteries. Since then it has also been used for running transistor radios and similar gear, testing power transistors and charging NiFe cells.

The circuit uses a half-wave voltage doubler followed by a conventional transistorised voltage regulator (with zener diode voltage reference) plus capacitance multiplier. A portion of this output voltage controls the second OC74, giving zero up to the zener voltage output, fully variable.



* Red spot on case.
† Adjust to maximum allowable zener current. Diodes OA10 or any diodes with forward current of 500 mA., and peak inverse voltage of 50 volt or more.
Zener Diode: Nominal 135 volt or as required. Transistors: T1-OC74 on at least 12.5 sq. cm. of heat sink.
T2-OC74.

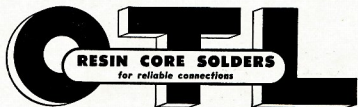
As the emphasis was on simplicity no overload protection was fitted. However, the regulation of the voltage doubler is so poor that at about 220 mA. output current there is insufficient voltage to maintain the zener action, regulation is lost and the output voltage drops sharply. Short-circuit current is less than 500 mA., which the OC74 presently in use has withstood on many occasions. But take note: this is considerably beyond its ratings of 310 mA., so keep a spare handy if you are careless. Also, if you can't afford numerous spares, don't take more than 50 mA. at less than 9 volts output voltage.

PERFORMANCE

Voltage range: 0-13.5 volt continuous.
Maximum output current: 200 mA. at 13.5 volt; 50 mA. at 6 volt.
Hum: 0.02% at 50 mA.
0.05% at 200 mA.
Regulation: -2% at 200 mA.

—D. M. Bennett, VK3ZRX.

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- ★ **Turner Ceramic P.t.t. Microphones**, £5; desk model, £10.
- ★ Still available, the **Autronic Automatic Keyer**, fully transistorised with built-in monitor and power supply, at the equivalent of the U.S. dollar price plus S.T., £35 net.
- ★ Next in line, expected soon, a range of **Hy-Gain Antenna** products, 3-band Yagis and 4-band Ground Planes, special mobile whip bases. Also Ham-M C.D. Rotators which will safely handle the largest beams, also lighter Alliance Rotators, safe for smaller beams and quads. Prices will be very attractive!
- ★ 5-position B. & W. Co-axial **Antenna Switches**, £6/10/0; a good duplicate of same with Amphenol connectors, £4/10/0; PL259 and SO239 Connectors at half the price elsewhere.
- ★ Still available, **Crystal Filters** and 8 and 9 Mc. **Crystals**, Jackson Bros. **Vernier Dials** and assemblies —a la Swan SW350, also ceramic air-trimmers with extension shafts for the home builders.
- ★ **Used equipment:** Swan SW120, 20 mx full coverage Transceiver, £90. Hallicrafters HT-37 10-80 mx Transmitter, £185.

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Book Review

AMATEUR RADIO CIRCUITS BOOK (R.S.G.B.).

As the title suggests, this is a book of circuits suitable for Amateur Radio constructors. A wide field of valves and semi-conductor applications is covered, but no text or descriptions accompany the circuits. Some are complete units, but most are of single stages.

Topics covered include antenna couplers, h.f. pre-amplifiers and converters, v.h.f. pre-amplifiers and converters, i.f. filters, mechanical filters, Q multipliers, product detectors, f.m. detectors, noise limiters, audio a.g.c., audio amplifiers and compressors, modulators, electronic keyers, T.R. switches, v.o.x., balanced modulators, mixers, linear amplifiers, power supplies, crystal oscillators, v.f.o.s, v.o.x., marker oscillators, test equipment, h.f. and v.h.f. reflectometers, and transistor transmitters. The circuits are printed on excellent paper and the book is spiral bound.

This book should become a standard reference in every Ham shack.

S.S.B. EQUIPMENT

(Reprinted from the R.S.G.B. Bulletin.)

In this booklet G2DAF has described his Mark 2 transmitter and power supply, and his linear amplifier. His design is complex and he has definite ideas on the approach to a s.s.b. transmitter.

The unit described uses the filter method of sideband suppression, and has been designed so that either a low frequency crystal filter or mechanical filter, or a high frequency crystal filter, may be used.

Information is given for the construction and alignment of the crystal filters, and the reasons given for the choice of the various conversion frequencies.

Some may not agree with the author on his particular approach to a s.s.b. transmitter, but the booklet will be interesting reading for all interested in s.s.b., and particularly for those contemplating construction of a transmitter.

RADIO AND TELEVISION RECEIVER CIRCUIT AND OPERATION (Revised Edition).

Alfred A. Ghirardi and Jess E. Dines.

At the present time there are no really good textbooks covering t.v. servicing available in Australia. Most of those that are available are obsolete. Therefore, despite the fact that American t.v. operates on different channel frequencies, band width and scanning frequencies, this book should be welcomed by students and servicemen alike.

Compiled by the well-known American t.v. and radio authorities, Ghirardi and Dines, this edition has been completely re-written to take advantage of the many technical advances made since publication of the original edition. Written in an easy to follow style, with the text amply illustrated with graphs and diagrams, the book commences with basic communication theory and comprehensively covers modern radio and television, a.m. and f.m. receivers, the design and structure of basic receiver components, larger television tubes, colour television, high efficiency tuners, and transistors. To assist the student, each section ends with a set of review questions.

The chapters dealing with u.h.f. tuners, and colour television, may not be of immediate interest, but the section dealing with transistorised t.v. receivers is excellent and the book is almost worth buying for this section alone. The binding paper and printing are of the highest quality and the Australian price of £5/5/6 for this 556-page book seems very reasonable.

Rigby Ltd., of Adelaide, are the sole Australian and New Zealand distributors and supplied the book for review.

COMMUNICATION RECEIVERS (R.S.G.B.)

This fine booklet produced for the R.S.G.B. by G2DAF must surely be one of the most comprehensive descriptions of circuitry suitable for a modern communications receiver yet published. The author is obviously an expert in this field and even though he has definite ideas or preferred circuits, he gives excellent arguments for his choice. The standards set for the finished receiver are equal to the highest priced commercial units, but the theory and construction portions of the booklet make no reference to transistors. This has apparently been brought about by a desire to use disposals parts and keep the cost down to a minimum.

An idea of the completeness of the booklet, which describes the preferred circuits for each stage of a receiver, is given by the attention paid to Miller effect in the i.f. amplifiers, and details of how to obtain linear calibration of the v.f.o. The third section of the booklet deals with a crystal locked converter for those who wish to use an existing receiver as the tuneable i.f.

In all, the booklet is a must for all those contemplating building, or modifying, a unit for use as a modern Amateur receiver.

MATHS. FOR THOSE THAT HATE IT Roy Hartkopf

Although this book does not deal with radio, it should be good reading for most Amateurs—and not only because the author is a Melbourne Amateur. Mathematics is an essential part of radio, and for those of us who struggle every time we encounter a problem this book could be the answer. It does not set out to teach mathematics in the ordinary sense, but rather to give the ordinary person a basic understanding, in simple language, of some of the practical aspects of mathematics, and the use—or misuse—

At first I was not overjoyed at the thought of reading a book about mathematics, but after perusing the first chapter my natural aversion to mathematics was overcome to the point of avidly reading the whole book. Nothing in mathematics is sacred to Mr. Hartkopf, and he takes delight in exploding conceptions held by most laymen about the subject. As well, he writes in an extremely humorous and direct style, which is easy to read. For example, the first page includes "The statement that one plus one is two might seem at first sight a perfect example of a universal and at the same time absolutely accurate truth. Actually it is neither. When we get down to real objects we often find it is impossible to add them together at all. One cow plus one bale of hay might make a contented cow. It might even eventually add up to a couple of gallons of milk but it certainly doesn't add up to two cow-bales."

Commencing with a chapter entitled "One plus one is Nothing," the book progresses through, amongst other things, lunar counting, logarithms, graphs, trigonometry and calculus with complex points brought down to earth and explained, often humorously, so that anyone can understand.

This hard-covered book of 250 pages is published by Rigby of Adelaide and sells for \$7/6.

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Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

ACKNOWLEDGMENT

Editor "A.R." Dear Sir,

With respect to the Technical Correspondence published in the October issue of "A.R." with regards to my Low Noise Two Metre Converter article in September issue, I overlooked, in my haste to achieve the publisher's deadline, the acknowledgment to Jeff Vale VK2ZP for supplying the relevant technical details enclosed in the letter. For the purpose of completeness I hereby submit an acknowledgment to Jeff for his assistance on the explanation.

—C. J. Hurst, VK2ZJH.

COST OF OVERSEAS EQUIPMENT

Editor "A.R." Dear Sir,

This is in reply to the letter by C. Whalley, VK6KK, in regard to the "Cost of Overseas Equipment."

If the retail export price of the Transceiver in question is about £A210, and if the importer receives a 20 per cent. discount, his cost will be about £168. Sales tax plus duty on these items comes to 46.5 per cent., therefore total cost will be about £286. Allow, say £5 for post. He sells the item here for £394, not including sales tax. That comes to about 38 per cent. profit. This is not excessive.

Consider another example. Our Explosure Meters, which are convertible to high sensitivity microammeters, cost \$1.50 retail in the U.S.A. We get 10 per cent. discount. Cost is therefore \$1.35. Sales tax plus duty is 52 per cent., therefore delivered cost is 18.5. 20 per cent. of them, however, are defective, raising the price effectively to 23/-. Postage adds about 8 per cent. We sell them for 30/0 or 32/6, depending on inherent sensitivity; about 50 per

cent. of each. This comes to an average profit of about 24.5 per cent. This is not excessive.

From this profit we have to pay a secretary and technician, and the manager is fortunate to get something left over, which he promptly puts back into new stock, because of the enormous capital investment necessary in any expanding enterprise.

Mr. Whalley must realise that "Overhead" is not a term invented by greedy capitalists, but comprises a considerable part of the cost of business activity. We used to share reservations similar to those expressed by Mr. Whalley, but this business quickly educated them out of us. Importing can be a hazardous and difficult activity, and most importers well and truly earn the profit they obtain. Private individuals who have tried it for themselves have often been quick to agree with this opinion.

—R. L. Gunther, Manager, Electronics Associates.

Editor "A.R." Dear Sir,

Your correspondent Mr. C. Whalley, VK6KK, in his letter published in the October issue has directed my attention to the fact that he has criticised importers like ourselves for making excessive charges in importing equipments, thus greatly magnifying the cost in overseas countries when compared to Australian selling prices.

I have been involved in importing Eddystone receivers since about 1955 as the Australian agent for Stratton and Co. Ltd. makers of these receivers. I have also been hamming it since 1928. Therefore I can speak with some degree of authority both as a Ham as well as an importer.

As VK6KK states, there is a great deal of mystery surrounding the importation of overseas equipments. To be really understood, one must be directly connected with the problem as my company is. Mr. Whalley has overlooked, for instance, the fact that customs duty must be paid on all imported goods when making out his financial sum of charges.

In answering this letter I feel that I would serve a universal purpose if I quoted a typical calculation as to what it would cost an Am-

ateur if he were to write over to see Webb's Radio in London and order an Eddystone EC-10 transistorised communications receiver to be shipped to Australia and deliver. Sales, or purchase tax, does not come into this consideration please note.

Amateur net price in U.K. (no sales tax)	£48 0 0
Packing case, say	1 0 0
Bill of lading, export formalities, etc.	3 0 0
Sea freight to Australia including insurance	4 4 0
	£56 4 0
Add exchange to convert to Aust. currency 25½%	14 6 8
	£70 10 8
Customs duty:	
Flat charge per receiver, £5	£5 0 0
Plus 27½% on £48 sterling	16 11 5
	£92 2 1
Clearing through Customs agent (raising of Customs entry), wharfage charges, delivery to W.H.F., etc., say	5 0 0
	£97 2 1

N.B.—R. H. Cunningham Pty. Ltd. selling price to Amateurs ... £95 19 9

Importers usually depend on a commission or discount to make their margins upon which to operate the business. I must explain, however, that Eddystone receivers are sold direct to the end user and additional profit margins are not provided for further handling houses. The policy of this company therefore does not necessarily conform to that of other organisations.

In addition to the service my company renders fellow Hams in bringing overseas equipments into Australia we also provide pre and after sales testing and service. A direct buyer must carry these functions himself of course.

I trust this explanation helps to clear up the "inexplicable mystery" as Mr. Whalley calls it.

—R. H. Cunningham, Managing Director, R. H. Cunningham Pty. Ltd.

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DX

VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: ALAN SHAWSMITH, VK4SS,

35 Whynot Street, West End, Brisbane, Qld.

ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Conditions are improving. All the bands are open with particularly good DX on 40, 20 and 15 mc. 28 Mc. has been showing signs of life in the direction of U.S.A. around 2200z.

The l.p. circuits as yet are not good, but 14 Mc. via S.A. to Europe in the afternoons often has some good rare prefixes on it to chase.

Probably the most consistent paths as of yet have been to Europe on 40 mc from 1700z onwards. To Europe on 20 mc nightly 1200z. To U.S.A. on 15 mc daily from 2200z. South Americans are workable on 7 Mc. around 1030z and on 14 Mc. from 0300z. A short week break through to South America on 21 Mc. sometimes occurs about 0300z.

Put on those phones. There's plenty to be heard!

NOTES AND NEWS

Indonesia (8F3): It's a past event now, but if you are still wondering what the pile up was all about, Don Miller did get a permit and operated as W9WNV/8F3. If you managed a ten-second QSO, send the card to W4EC1.

Georgia: UFEUB is very active on s.s.b. 14.280 at 1930z might be good enough.

Ascension Is.: ZDEAR is expected to be on during Nov. and especially during "CQ" contest.

Swan Is.: KS5AB is reported active around 1700 Kc. Try about 0600z.

Baleares Is.: EA6BD on 14.030 at 2300z.

Vatican: HV1CN very busy on 14.775 at 2100z.

Thailand: HS1H on 14.105 at 1230z.

Cocos Keeling: VK3JO frequents 14.270 about 1200z.

Marens: KG6IF: Try scanning the dial around 14.275 at about 0200z.

China: Maybe you worked BY4SK, if so QSL to Ack W4EC1. More operation behind the bamboo curtain is expected by V560J very soon.

Fernando De Noronha: PYTACQ is expected to open up from this rare one about the time this reaches your box, so keep an ear open for any pile-ups. No other info. available.

Gough Island: ZD9BC is awaiting s.s.b. equipment. Expect this mode of activity any time now.

Albania: ZA1AB very active on 14.025, but reported as a pirate.

British Guinea: VP3MV 21.400 s.s.b. at 1700z. QSL to W2UOX.

Mongolia: JT1AG said to be active on 14.035 around midnight our time.

St. Pierre Is.: FP6CA, 14.248 at 1700z.

Caribbean Stn.: VP2KM St. Kitts, VP2AL Antigua, VP2SK St. Vincent, all using s.s.b. 14.

U.S.S.R.-North Pole: UP0L-13 on 14.030 about 0900z.

Kazakh: ULTFA 14.131 and ULTFB 14.043 0140z.

Portuguese Guinea: CB3AD, 14.974 at 2300z.

Malagasy Republic: RRBCB on 21.000 at 1800z.

Rwanda: 9X5CE, 14.255 at 1930z.

Monaue: WA6ZIQ reported delayed in his attempt to operate from 3A0.

Jan Mayen: This rare spot now has several operators both s.s.b. and c.w. Keep listening on 20 when the s.p. to Europe is open.

Bahrain: MF4BC, 14.346, 1700z.

(Much of the above info. by courtesy of LIDXA.)

Tahiti: FO3BI is a regular on 21 and 28 c.w. mostly from 2200z.

Korea: Several HM's 1-3 are active on 15 mc from 2200z. HM1DE, HM1BB, HM2BV, HM2CR, HM2BF, HM2BZ are some.

DON'T FORGET

your VK/ZL Contest Log!

Deadline for local contestants is 15th December, 1965.

Deadline for overseas entrants is 15th January, 1966.

Caucasian Area: Several U prefixes are usually workable each day from noon our time on 20 s.s.b. and c.w.

Kuching: 9M8FS is good for WPK, 14.080 at 1400z.

Cuba: CO2BB, 21.550 at 2200z. Mostly working U.S.A.

S.E. Asia: W9WNV, Don Miller, currently signing HS 14.000. Several more rare prefixes are to come. Just listen for the big pile-up on all bands and modes.

Central America and Indies: Ken VK3TL reports 40 mc to this area very good around 1030z nightly. Some prefixes are CO2BB, VP3LP, VP4DS, VP5AR, HF1BR, etc.

ACTIVITIES

Dud VK4MY (now settled on the Gold Coast from VK3) reports working the following on 14 c.w.: UPRFX 1429, UASKEBO 1353, K2GSSZ 0133, OK1FP 1333, UW0FK 0748, SP5YA 1320, OACDZ 0455, XZ1EK 0545, UW0IQ 0658, UA9DQ 1214, ULTKYF 1342, LIBDE 0820, VE2BB 0540, UZ3MKZ 1330, UZCAR 1350, also several others.

Ken VK3TL shows what good DX is available by the following report. He lists as worked on 20 mc: BY4SK, CE1DP, CE1DK, CE8EW, CH9AK, GBSWAD, GD3RFK, HM3CG, HP1BR, IS1RU, JTKAA, VT2AA, Y7Y4, KG4AA, K6GSS (Saban), ON5A/LX, OR0NI, OD5RZ, OD5RE, OD5EG, PJ3CR, PJ2MI (Saint Maarten), VP2SK (St. Vincent), ZB2AL, 4V2AA, W9WNV/8F2, worked on 40 mc: VP1LP, VP4DS (Trinidad), VP5AR (Grand Turk Is.), YJ7WE. Best QSL's received: EP2VX, SV1AT, 9X5MW, 9J2FF, CE9AG, FB8YU, 9J2VB, OD5A, HB6AF (Liechtenstein), 7X2AM, 9L1JR, BL1SL, 4X0WQ (QSO in 1962), 7Z3AB, VQ2DT, 9M6KZ, EP3RO.

Z equals G.M.T.

My grateful thanks to SWL Chaz, Thorpe, L4021, who regularly contributes information on Oceania activities.

DX good listening, T3, A1, VK4SS.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer.	C'tnt.	Call	Cer.	C'tnt.
VK3MS	24	320	VK2JZ	61	240
VK5AB	45	312	VK2ADE	65	231
VK6RU	45	307	VK4HR	12	223
VK3AK	45	303	VK0KW	11	211
VK3AHO	51	301	VK3WL	14	211
VK4FJ	21	283	VK2AAK	58	208

Amendment:

VK2AGH 55 114

C.W.

Call	Cer.	C'tnt.	Call	Cer.	C'tnt.
VK3KB	10	335	VK2AGH	71	277
VK3CL	5	308	VK3BO	2	267
VK3CX	26	306	VK6RU	18	262
VK4FJ	28	300	VK3AHQ	79	260
VK2ADE	1	298	VK3AC	53	253
VK3NC	19	286	VK3XB	75	247

Amendments:

VK3YL	39	246	VK3RJ	42	231
VK4HR	8	240	VK3AXK	30	204

OPEN

Call	Cer.	C'tnt.	Call	Cer.	C'tnt.
VK2ADE	28	322	VK2ACK	6	300
VK6RU	9	312	VK3NC	77	287
VK2AGH	83	309	VK3JA	27	271
VK4FJ	32	308	VK4HR	7	264
VK6MK	74	307	VK2VN	18	247
VK3AHO	79	306	VK7IZ	23	242

31st A.R.R.L. DX CONTEST RESULTS

AUSTRALIA

Final Score	Multiplier	Contacts	Hours	Operating Time
C.W.:				
VK5ZP	397,758	66	1561	50
VK3GW	245,898	59	1387	65
VK2EO	190,512	49	1296	48
VK1APK	185,285	55	1129	—
VK3AXK	55,212	33	988	32
VK3KO	58,628	33	397	28
VK2VN	30,730	45	228	8
VK3QK	29,280	34	280	—
VK3XB	5,286	12	146	4
Phone:				
VK1APK	63,756	42	506	—
VK3ATN	41,595	47	295	10
VK4LT	11,934	28	154	—
VK3XB	9	9	96	—
VK2PN	342	6	19	2

NEW ZEALAND

C.W.:				
ZL1AFW	80,580	44	614	22
ZL1BO	12,670	17	245	—
ZL1OY	3,528	14	84	—
ZL1QW	360	6	20	2
Phone:				
ZL1AGO	59,833	49	406	—
ZL1ML	9,378	18	174	9



CONTEST CALENDAR

- 3rd/4th November:— V.I.R.L. Anniversary Contest, phone.
- 6th/7th November:— 4th R.S.G.B. 7 Mc. DX Contest, c.w. section.
- 20th/21st November:— 2nd R.S.G.B. 1.8 Mc. Contest.
- 27th/28th November:— "CQ" World Wide DX Contest, c.w. section.
- 15th December:— ZL V.h.f. Field Day.
- 15th December/16th January:— Ross A. Hull Memorial Trophy V.h.f. Contest.
- 15th/16th February:— John Moyle Memorial National Field Day Contest.

A. R. R. L.

Associate Memberships (and renewals) are available by forwarding £2/14/- (plus 6d. interstate cheques) to:

Business Manager, W.I.A., 49 Cookson Street, Camberwell, E.6, Victoria.

This includes the regular arrival of

"QST"

As you will observe, the notes are rather brief this time as VK2, VK3 and VK5 were the only parts interested enough in writing and unfortunately they did not arrive until late, which has restricted any survey being made. We hope that this will only be a temporary lapse and all will arrive promptly next month. Please time your notes to arrive by the 2nd of each month otherwise they cannot be considered.

What is your opinion of these notes? Are they serving a useful purpose? In recording v.h.f. activity and opinion? With the difficulty in collecting news from the various Divisions would anyone miss this page if it were removed? Let's have your opinion—both from individuals and from the groups. If you think it is worth while let me know. The first five letters will be included for all those interested to read.

Don't forget to patronise the various field days now being organised for you. 73, ZGPP.

NEW SOUTH WALES

The Group meets regularly on the first Friday of the month. The November meeting will be on the 5th. The December meeting, which is the annual auction night, is on the 3rd, and the January meeting on the 7th will be a social night.

To the end of September there had not apparently been any worthwhile 6 metre openings.

The 6 metre "fox hunt" for October proved to be a win for the fox, 22TM, when the hounds could not find the "road" in the park. After the fall event time had run they were called in.

The event for November will be on Wednesday, the 10th, with 22XY as fox. The December 6 metre event will be on the 22nd. A small Christmas party will follow the event. Keith 22VL will be the fox.

VICTORIA

It looks like the DX season has started with openings to VK4 on 6 late in the afternoon on the 5th. Reports of interference to television on Channel 6 have been reported on a number of occasions during the past month.

Many new stations are appearing on the band, particularly on the net frequencies both a.m. and i.m. Activity is increasing at the low end of the band with a number of the old regulars appearing.

Two is seeing its share of activity now the weather is improving and regular openings

to Mt. Gambier and Deniliquin are keeping the locals happy.

The VK3 v.h.f. group has established a register of v.h.f. enthusiasts and welcomes all those interested and who are members of the W.L.A. to join. This may be done at any group meeting or by writing to VK3ZGP Len Poynter, 14 Esther Court, Fawkner, including name, address, call sign, telephone number and what bands you are active or interested in.

Field days in VK3 this season take place on Nov. 21 and Dec. 18, New Year week-end and during the N.E.D. Feb. and March 19. See you there. 73, ZGCK.

SOUTH AUSTRALIA

Activity is VK5 is at last lifting itself from beneath the noise level and approaching the pre-Christmas activity level that is characteristic within the v.h.f. fraternity of VK5.

The outstanding v.h.f. event of the year and possibly for future years will be the Amateur Television Display exhibited at the 1965 Royal Adelaide Show. The display, which was housed in the W.R.E. Pavilion, consisted of a television set receiving a programmed transmission from the QTH of George VK5ZEY. In order that entertainment value could be transmitted a special licence and frequency was allocated in the v.h.f. region. The majority of programmes televised emanated from the studios of George VK5ZEY. Entertainment value of excellent quality was provided at all times, and consisted of films, interviews, news and live broadcasts utilising the talents of local musicians of the modern variety.

Perhaps the highlight of the whole project was the successful conduction of two outside telecasts, one of a football match and the other of a model car racing circuit. From reports to hand the transmissions were of excellent quality, putting to shame the so-called professional quality dished out by the local t.v. stations.

The efforts applied to this exhibition by all concerned no doubt boosted the outlook of the community towards the radio Amateur. Those primarily responsible for this outstanding achievement were George VK5ZEY and Maitland VK5AO with assistance from John 52ZJ, Rick 52FQ, Jim 52GV, Howard 52BE and Peter 52ZZ.

Two-metre activity received a boost when the P.M.G. decreed that Port Pirie was a television "fringe area" and that Radio Amateurs were not responsible for any interference experienced by viewers, providing that

reception of the local Channel 1 was not interfered with.

This would allow Jim ZMJ and John 52C to work into Adelaide, a path of 120 miles, on a more regular basis. No DX openings on 6 metres have been reported up till 20th September, although the reception of Channel 6 from Brisbane and Melbourne is regularly noted.

2-metre Scramble was held on Sunday, 28th September, with the eventual winners being Edwin 52TS and Brian 52BR. Considerable interest is being shown in Oscar IV although the re-transmission on 43.8 Mcs. has caught the unprepared on the wrong foot. 73, Colin, VK5ZHL.

VK8

Doug 8KK is to be active on 6 and 2 this season and is working on a 2-metre final.

Currently interested in "Moonbounce" with c.w. as the preferred mode, Doug has a tower to go up as soon as he can "blend" it into the skyline so that it is not noticed.

ZL

On December 12 there will be a V.H.F. Field Day in ZL on all v.h.f. bands between 9 a.m. and 6 p.m. N.Z.T. (2100 G.M.T. 11/12/65 to 0300 G.M.T. 12/12/65). They will be on the lookout for VK contacts.

Bill ZL2CD reports steady v.h.f. activity.

★

96 ELEMENTS—HAND-HELD



This photo was received by Jim Stewart (VK3ZFS) from Jim Goding (VK3ZGG), who is at present in Macarthur, U.S.A. This print was taken at the 73 Hamfest at Peterborough. It shows the prizewinning antenna in the antenna contest—96 elements on 432 Mc. You can imagine it was a problem because it had to be hand held, but they managed it OK. Jim first saw it amid and inverted on the top of a big old Chev. It looked like an enormous bedstead and completely occupied the whole surface area of the top of the car.

It was one of the successful antennas used in the first July Arechie Moonbounce effort. Signals from Arechie were so strong that one of the chaps operating the club station thought he was trying a dipole. He made the little dipole (he's in the left foreground of the snap) on a co-ax receptacle and plugged into the feed line—lo, they could still hear Sam!

V.H.F./U.H.F. STATE RECORDS — SEPTEMBER 1965

New South Wales:				
50 Mcs.	VK1ADE to VETAQQ	8/4/59	7230 Miles	
144 "	VK1ZMR to ZL2AAH	8/1/65	1410 "	
432 "	VK1YF/1 to VK3ZPT	14/6/65	178 "	
576 "	No claim			
1215 "	VK2ZAC to VK2ZCF/2	4/3/63	46.8 "	
Victoria:				
50 Mcs.	VK3ALZ to XE1FU	1/5/59	9418 Miles	
144 "	VK3ZEA to VK4HD	27/12/61	804 "	
432 "	VK3AEE to VK7LZ	15/1/65	282 "	
576 "	VK3AKR to VK3ANW	11/15/49	80.7 "	
2300 "	VK3KA to VK3ANW	12/2/50	9.0 "	
3300 "	VK3ZGT/3ZGK/3 to VK3ZDQ/3	14/12/63	63.5 "	
Queensland:				
50 Mcs.	VK4ZAZ to KGERG	16/3/58	5305 Miles	
144 "	VK4ZAX to VK7ZAO	27/12/61	1107 "	
432 "	No claim			
	No other claims			
South Australia:				
50 Mcs.	VK5KSL to W7AC5/KH6	26/8/47	5361 Miles	
144 "	VK5ZHL to VK5ZLH	8/2/65	125 "	
432 "	VK5SAW to VK3AEE	13/11/64	225.5 "	
*576 "	VK5ZTM/5ZFG/5 to VK5ZIS/5ZLH/5	28/1/65	105.5 "	
1215 "	VK5LA/5 to VK5ZCR/5	4/1/62	1.0 "	
Western Australia:				
50 Mcs.	VK6BE to JA8BP	30/10/58	5490 Miles	
144 "	VK6ZCN to VK5ZHL	8/1/65	1330 "	
*432 "	VK6ZDS to VK6LX/6	30/6/58	28 "	
576 "	VK6ZDS/6 to VK6LX/6	15/12/63	101.2 "	
Tasmania:				
50 Mcs.	VK7LZ to JA9IL	3/12/59	5426 Miles	
144 "	VK7ZAO to VK4ZAX	27/12/61	1107 "	
432 "	VK7LZ to VK3AEE	15/1/65	282 "	
	No other claims			
Papua Territory:				
50 Mcs.	VK9AU to KH8BY	30/4/60	4312 Miles	
	No other claims			

YOUTH RADIO CLUBS

Most "civilised" countries need a vigorous de-bunking of the sloppy sentimentalists who think that providing opportunities for people means mere generosity of giving without the proper challenge and training in responsibility. The Duke of Edinburgh's Award is a case in point. I hope the award is not of its essence. Another excellent scheme is that organised yearly by the Science Teachers' Association. It has two main aims: (a) to encourage science teachers to make independent suggestions along lines of their own choice and encourage development of experimental techniques; (b) to encourage students to explain clearly and effectively both in writing and orally their purposes, methods and results. On their own merits, these Talent Search competitions have great success with a 1964 record entry in VK3 of 200 projects of high standard, and 1965 will be higher.

When this success is reinforced by the support of a big commercial firm such as A.W.V., the results must be far-reaching. A.W.V., organised "Operation Flip-Flop" in conjunction with the Talent Search. No less than 15,000 Australian schools were supplied with a prohibition, with copies of the flip-flop circuit. Entrants were to construct the unit, answer questions and write 200 words on the "Place of Transistors in Electronics Today." The winner, Roy Francis, of Springvale High, produced an extremely well constructed model on matrix board and an excellent report on the construction. It is worth repeating: "Industrial sponsors, by offering such encouragement and assistance are helping to help themselves to help the scientists and engineers that are going to be needed so urgently by this country in the years ahead." It is a commendable aim. More effective way of distributing 15,000 transistors, but all honour to such industrial sponsor. Each Division Council find some of the best. Any school where anything happens to read this, I'll constructively ask some more questions. Have you supplied instruction in the use of transistors in secondary Education? Have you convinced the science lecturers at your Teachers' Colleges? Have you encouraged the teachers in the science scheme, proved so effective in U.S.A.? (In case there are any rude remarks from PS, I do get an occasional snarl.)

The VK3 has been making great strides forward. They now have 25 clubs, a pleasing number of industrial sponsors (public and company), enough enthusiastic teachers and Matchett and Dave Buck to keep things going well. If they could only make a breakthrough in the schools, they will take over VK2 (now up to 42 clubs). I place great importance on convincing science teachers in training (through their college) that Y.R.S. will be of great benefit. Typical industrial sponsors in VK3 are Transistor Kits Pty. Ltd. (donation of a kit to highest mark in Elementary Technical School Magazine), 120 for highest mark in Junior), and Adco Manufacturing Co. (quantity of soldering irons to be distributed to the school). Some industrial sponsors are generous but prefer to be anonymous.

Rex 2YA should be looking after himself more, but he is very active as usual. He writes a column in the "Y.R.S."—attended Punchbowl Boys' High Fete Day yesterday and was pleased to see the Radio Club at the fete. He is a very active member, operating well, with a great line-up of boxed units labelled with the various Elementary Constructional projects. Mr. Stittage is the master and all our way. Mr. Mudford is O.C. Club. Also went to D.C.A. Radio School Open Day—really good show indeed. Fine roll-up of parents, friends, students and Y.R.S. is having a look-see. All very impressed. Attended Clemon Park Scout Hall last week—11 members of the club. Mr. Stittage received Wirelesserman's Badge, thanks to good work of Stan Burke 2EL. These lads will now go to get their own Y.R.S. units. They are forward to taking part in Jambooree of the Air with Stan's s.s.b. transceiver operating from the Scout Hall."

R.R. an impression in many places outside its own circle of the converted. I hope you noticed mention in the "Y.R.S." of the R.R. and other people similar to ours. They are keen on trans-Tasman co-operation and have offered a pennant to the Y.R.S. competition. We reciprocated. They did not expect to get off the ground until 1966. There was also a write up of Y.R.S. in "Education News", the journal of the Committee for Educational Research, which is at the higher level in Education circles. There

was a small article in "Popular Electronics" several months ago, and the P.M.C.'s own magazine has given us some publicity.

The only Foster Group I have news of is the one organised by the Y.R.S. and the Y.R.S. A competition (Essay on "Rescue from Electric Shock") was won by Peter Hardiman (16), of Warrawee, who will receive a handy parcel with three transistors and other goodies. Roger believes safety is very important in Y.R.S. training (again, Club Leaders please be careful of electrical safety).

It is pretty sure there are things afoot in VK4, 5, 6 and 7, but I haven't anything definite. It would help if I had a reader there. (Not you, PS, please!) 73, Ken 1KM.



YOUTH RADIO SCHEME

THE ELEMENTARY RADIO CERTIFICATE

To qualify for this award (issued by the Wireless Institute of Australia) a candidate must meet the following requirements and pass the specified tests:—

1. Must have been an associate member of the Wireless Institute or a financial member of an affiliated Radio Club or a registered member of a recognised Radio Club or a non-club participant in the Youth Radio Scheme for a period of at least one month;
2. Must produce a written statement or school report (in the case of a candidate who is still attending school) to show that he has gained passes in mathematics and science at the most recent school examination;
3. Must submit evidence to show that he or his parents hold a current Broadcast Listener's licence;
4. Must demonstrate ability to make work-manlike soldered joints and connections and must answer oral questions about soldering methods as applied to Radio and Electrical construction;
5. Must identify eighteen out of twenty radio components displayed on a table;
6. Must complete a high standard of workmanship and performance three of the following projects: (a) a crystal set; (b) a Morse code practice set; (c) a hand-operated (d) self-powered telephone; (e) a one-way telephone operating over a distance of 50 yards or between two rooms; (f) a continuity tester; (g) a radio set.

7. Must select a topic in the science course associated with electricity, magnetism or electronics; (h) must select a topic in the science course associated with electricity, magnetism or electronics; (i) a project in the high school electrotechnics course approved by the Manual Arts Master (applicable to N.S.W. candidates); (j) three laboratory experiments relating to electricity, magnetism or electronics, to the satisfaction of the Science Master; (k) such other project of equal or greater difficulty as may be approved by the Club Leader;

8. Must submit a neatly compiled Radio Notebook containing all the information received in the course of the topics specified for this Certificate;

9. Must gain at least 70 per cent. of the possible marks in a written examination based on the following subjects:—

- (a) An Introduction to the Youth Radio Scheme. The Wireless Institute of Australia, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702, 2703, 2704, 2705, 2706, 2707, 2708, 2709, 2710, 2711, 2712, 2713, 2714, 2715, 2716, 2717, 2718, 2719, 2720, 2721, 2722, 2723, 2724, 2725, 2726, 2727, 2728, 2729, 2730, 2731, 2732, 2733, 2734, 2735, 2736, 2737, 2738, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2746, 2747, 2748, 2749, 2750, 2751, 2752, 2753, 2754, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2795, 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953, 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3618, 3619, 3620, 3621, 3622, 3623, 3624, 3625, 3626, 3627, 3628, 3629, 3630, 3631, 3632, 3633, 3634, 3635, 3636, 3637, 3638, 3639, 3640, 3641, 3642, 364

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

The A.R.R.L. advises the following changes, effective immediately, in their QSL Bureau set-up:

KV3V, Virgin Islands: Graciano Belardo, VK4CF, P.O. Box 572, Christened, St. Croix, Virgin Islands, 00829.
WV3V, Virgin Islands: R. Hubbard, WA8CXI, 921 Market Street, Zanesville, Ohio, 43701.

Norm Gee, VK3QD, toured Japan during October and met many of the hundreds of Jap. Hams, whom he had contacted over the years on 21 Mc.

Jack Van Lear, VK1QZ, writes: I am operating aboard the M.V. Sea Search off the W.A. coast and have given my QSL address as the VK3 QSL Bureau, due to the fact that I also hold the Call VK2IQ, and am a member of the O.P.A.L., N.S.W. Division. I first started to operate with the call VK3R/m (no home call) and as this ship is registered in Nassau I now have the call VP1DO.

The D.A.R.C. writes: There are reasons to term you that D.A.R.C., member society of I.A.R.U. in the Federal Republic of Germany, is alone authorised to distribute QSL cards to our Radio Amateurs. The QSL address is and will be in future: D.A.R.C. QSL Bureau, P.O. Box 99, 8 München (Munich) 27, Germany.

The Yase sails again! Not actually, but at least in spirit! The Yase Foundation has been re-activated with some changes and additions to its immediate objectives. It is to sponsor the world-wide DXpedition activities of Iria and Lloyd Colvin. The present officers and directors of Yase are: President, Dan Denny, VE1ZB, etc.; Vice-President, Hal Sears, K5JLA; Secretary (and QSL manager), Bob Allen, W6RGQ; Treasurer, Ed Peck, W6LDD; Directors: Goldenrod, Dick Spenceley, KV4AA, Charles Bidde, W6GN, Jack Dudge-Costas, G2DC, and Frank Campbell, W5GJQ.

Iris Colvin, KL7DTB/6, and Lloyd Colvin, W6KG, departed on an extended DXpedition that is hoped to include operation from most of the rare and semi-rare countries of the world. The trip will be primarily by commercial aircraft. The gear includes a Collins 73S-3 receiver, 32S-3 exciter, 30L-1 amplifier and in most cases a Hy Gain tri-band beam (4 144V's vertical is available as an alternate). Iria and Lloyd have already visited 96 countries and held 21 different calls. Written application has been made to operate in approximately 150 countries. Iria and Lloyd say they will go anywhere. The present operating plan calls for operation from Pacific areas, then the Middle East, then Africa.

Iria and Lloyd will operate on 7000-10, 14065-55, 21045-55 Kc. e.w., and for s.a.b. 7000-10, 14100-10 Kc., but no operating schedule. Only one QSO per band, per mode is requested. Time G.M.T. All QSL's answered. QSL address is The Yase Foundation, P.O. Box 2025, Castro Valley, California, U.S.A.

—Ray Jones, VK3RJ, Manager.

NEW SOUTH WALES

Ted Whitting VK2ACD provided a very interesting and informative lecture on U.H.F. Radio Links as used by DCA in their point to point circuits, to the September general meeting. The speaker, who has over 20 metre operators, showed that he was well versed on subjects in the u.h.f. region, and who knows, we may yet have to find him a frequency on 2 metres.

The lecture for November will be given by VK2AOU on "How I Built My s.a.b. Transmitter" on Friday, 28th, at 8 p.m., at W.L.C.

The December general meeting will be on the third Friday (24th) at W.L.C. It will be a social evening and a film programme has been arranged.

On 28th November, the VK3 Division will be holding a "family picnic day" at Lake Parramatta. The idea is to give the XYL and harmonious day, and a minimum. When "Hams" meet is this possible?

Divisional membership is growing slowly but we would like some more. Twenty-three new members were admitted during September.

The QSL Bureau is still handling a record number of cards which seems to dispel any belief that activity is poor. At the present rate the bureau expects to handle 40,000 cards for the year.

Mr. Fin Stewart (C/O, Dalgety & New Zealand Loan, 15 Bent St., Sydney) is a collector of vintage radio and electrical equipment. He would like to get in touch with anyone of similar interests.

W.L.C.E.N. in VK2 is proceeding well with new interest, particularly in the v.h.f. region. Regular meetings have been held and take place on the second Friday of the month at W.L.C. The W.L.C.E.N. office bearers appointed include Secretary Peter Campbell VK2AXJ, Treasurer Don Miller VK3GN and Registrar Arthur Reynolds VK2ZB, whose duty it will be to keep a list of all members and their address, phone number, type of equipment, etc., so that a plan of operations can be implemented quickly in an emergency. W.L.C.E.N. officer to council is Vile Cole, VK2VL.

The present plan is to form a group of mobile operators on 148 Mc. 12C and 53 m., who can be despatched to any area within 100 miles of Sydney and be controlled either from Dural (VK2WI) or from six or eight base stations. Both the base and mobile are operating. Approximately 50 mobile stations will be operating in a few weeks.

The next step will be to organise the country nets on 3.5 and 7 Mcs. The September meeting of W.L.C.E.N. heard a lecture by Keith, VK2ZAR, on converting the V by telephone to 3 metres.

Zone officers have been appointed in three of the six areas in VK2 and it is hoped to have the last four in the near future. The Area 1 (North Coast) is VK2AGE, Area 2 (North Western and New England) VK2BMK, and Area 3 (South Western and New South Wales) is VK2BZ. The areas are the same as the Civil Defence zones (and used by W.L.C.E.N.).

A Zone 1 hook-up takes place every Tuesday night from 2300 E.S.T. to 1000 G.M.T. on about 3600 Kc.

These appointments will be important in the reorganisation of the W.L.C.E.N. system into Blue Mountains. This section, which meets on the third Friday of the month, recently announced that they were transferring their meetings back to the old Council Chambers at Lawson.

An s.b. station was operated at the Dubbo Trade Fair on September 4 last. Two dipoles on 40 and 26, it provided the public with an opportunity to see Amateur Radio. The station was set up and operated by VK3's AZW, AKC and AMK.

Griffith Radio Club is again active with about 15 members. Max Brigg, who is a science teacher at Griffith High School, is going to sit for his A.O.C.P. in the near future. Lectures at the club are being given in 24XK and Eric ZALL and assisted by Stewart 2PL.

HUNTER BRANCH

A funny thing happened to me on the way to the Convention. I saw an employee of the Paddy Maloney's Goat Department crawling about on the roof of the emporium of Marcus Clark in the Newcastle suburb of Wallsend. The thing was that he told me that he was erecting an aerial for the inter-zone hook-up—on the roof of the Newcastle suburb of Wallsend. Very well at the fourteenth Annual Convention of the Branch which was held during the six-day week-end.

Activities commenced on Friday night with the homebuilt competition competition which attracted eight competitors with a most varied and exciting variety of equipment. Those taking part were: Bill Z2W-2 and 6 metre transmitter; Des Z2DN-1 tri-band transmitter receiver on 144 and 148 Mc.; Mac Z2Z-2 metre i.f.o.; John Bedford—tuning equipment for hill climbs; Ian O'Toole—additive frequency meter; Tony Z2CT-2 and 40

SILENT KEY

It is with deep regret that we record the passing of:

VK3ADM—D. E. McCarthy.

metre transistor receiver: Alex Z2Z—tri-band s.s.b. transceiver, and Les Z2J—power supply. All told it became a very difficult task for the judges and members of the large audience of 50 to decide which item described best deserved the award for the night. So close was the voting that it was decided to award a joint award to both items and Des Z2DN for the most praiseworthy effort.

The display at the equipment competition is a true reflection of the most worthwhile effort which has been made by members of the Hunter Branch. For the third year in succession members have shown that they can produce novel and technically efficient equipment built to standard which would hold its own with Amateur constructed equipment anywhere. When it is considered that this work is done in the spare time of about 100, it is all the more commendable.

The Convention Dinner was held on the Saturday night at a new venue, the Drill Hall in King Street, where 42 were present to hear the guest speaker, Mr. Arthur Gubb of the A.W.V. Company, speak on the latest developments in semi-conductor devices. The convention was held at the Drill Hall in King Street, where 42 were present to hear the guest speaker, Mr. Arthur Gubb of the A.W.V. Company, speak on the latest developments in semi-conductor devices. The convention was held at the Drill Hall in King Street, where 42 were present to hear the guest speaker, Mr. Arthur Gubb of the A.W.V. Company, speak on the latest developments in semi-conductor devices. The convention was held at the Drill Hall in King Street, where 42 were present to hear the guest speaker, Mr. Arthur Gubb of the A.W.V. Company, speak on the latest developments in semi-conductor devices.

Once again the venue for the Field Day was the Drill Hall at Murrumbidgee Point on Lake Macquarie. The day was fine and a very good roll up of members and visitors ensured an excellent day for competitors and non-competitors. Transmitters were hidden in very obscure places and many were the wings of short-circuits and loose connections. There is promise of an amended schedule next year to make provision for many more transmitters and shorter contests. This should prove popular with the visiting direction finders. Refreshments were supplied this year by the Wests Radio Club and it is hoped to make this a regular feature at future conventions.

During the school holidays, ten members of the Wests Radio Club visited Sydney to be conducted on tours to many of the famous radio studios and the Amalgamated Wireless Valve works at Rydalmere. This was a good opportunity for the club members to gain first-hand experience of job possibilities in the electronics field. Most of them also completed the "Operation Multiplication" organized by the Valve Company and they are hopeful of some good results.

As a result of the recent Convention, it may be necessary to place restrictive points allowance on Sydney members driving Morris cars—green ones. That Andrews man now knows how to get along the roads of the lakeside district and it appears that transmitters will have to become /MM to defeat him. Well, well, we see. Those who claim that all affairs are swindles should ask Margaret Lloyd, harmonic of Stan 24YL, when I'm sure that doubters will be persuaded otherwise. Of course, conditions for transistor radios is another matter.

The latest call in the Branch area is that of Allen ex-G2DM, once known by his actual name as "Rob Macchettie". He is now fitting in well with the new currency, being now worth only half the previous value at 22Z. He is a very good fellow and would like to join our ranks and we welcome him. And while speaking of ranks, there is the tale of the "Hans" who is a very good fellow and would like to join our ranks and we welcome him. And while speaking of ranks, there is the tale of the "Hans" who is a very good fellow and would like to join our ranks and we welcome him. And while speaking of ranks, there is the tale of the "Hans" who is a very good fellow and would like to join our ranks and we welcome him.

BLUE MOUNTAINS SECTION

The B.M.S. of the VKZ Division will be holding their 1965 Field Day on November 21 and a full programme has been arranged. This year it is hoped that members of the V.Y.S. B.M.S. will be able to participate in the field events.

The field day location will be at the Lawson Swimming Pool grounds, and registration will start at 10.00. The programme includes: 11.15 a.m., 144 Mcs. s.s.b. Tx Hunt; 12.00 Lunch; 1.00 p.m., 144 Mcs. Hidden Tx Hunt; 1.30 p.m., Bus trip for the ladies; 2.15 to 2.45 p.m., 144 Mcs. Scramble; 3.00 p.m. to 4.00 p.m. Mcs. Scramble; 4.15 p.m., Prize presentation.

Registration \$1 for each member (including the family). There will be the usual ice creams, drinks and hot water, free. Lucky numbers and lucky dip.

Make November 21 your day for a trip to the mountains—the weather should be perfect. 73, VKHZH.

SYDNEY YLS

The Sydney YLs had an inspection of the D.C.A. communications at Mascot on September 6 with 16 in the party. A great deal of confidence in the safety of air travel was generated as a result of the visit. We had lunch in the Overseas Terminal where we could watch the jets landing and take a thrill of travel without the attendant bother.

There is no month to report this month, as school holidays slow down most radio activity. However, Hebe VKZKA has been very busy. VKZKAIA have been able to pay me a visit in the bush and Hebe brought her little red-haired daughter by name Hebe.

Verie VKZMR has been hit with the 'flu again but now that summer is here she will find the 'flu less of a bother. Freda VKZHU Hebe has had a few words with Freda VKZSU lately. 73, Mona, 2AXS.

CENTRAL COAST

The last meeting of the Central Coast Amateur Radio Club was held on Friday, September 17, with an attendance of 18. It had been planned to have a men talk about their "radio-activity" but there was so much business to discuss that only Frank Pearson VKZAA and Gordon VKZKA were able to be heard. Frank showed some of his mobile aerials and has left on a four weeks' tour of the W.A. and Victoria when he will contact other Hams along the way. Gordon is the Liaison Officer of the W.I.A. Gordon showed some of the work that the students are doing.

Phil Thompson VKZTX has left on a tour of the outback with his wife and daughter. The Simpson Desert and will no doubt have a lot to tell on his return. He is in regular contact with the VKZ group. The VKZ report their group had made camp near the "DIG" tree of Burke and Wills. John Trewhell VKZYL, John Joy and Harmonie Jill have had just a enjoyable day in the Warrumbungles, Lightning Ridge, Broken Hill. They said there were no opals in "them thar hills" but plenty of good opals. They brought back some excellent colour slides which are bound to whet the radio appetite of anyone who looks at them.

From all reports, Lindsay VKZON is having an interesting overseas tour. Last bit of news was that he was in Scotland but did not appreciate the temperatures there. They place like Australia when it comes to climate. We have everything from snow to the tropics and there is no need for a passport if you want to go from one to the other.

We were very sorry to have to accept the resignation of Percy Day who has been our treasurer for the last year and a half. Percy has been in the VKZ for many years but always made an effort to be active. He attended the radio classes held last year and was also the treasurer for the last year. He has a bus job and it is hoped that he will recover his health and continue his interest in radio.

Alec VKZAAK is to be the QSL manager for the VKZ and W.I.A. members who wish to make use of this service are asked to bring along their cards to the meetings.

Convention and Field Day time is upon us and this is a timely reminder that the Central Coast Field Day will be held at Gosford on Sunday around the middle of February. This is the usual time but, as yet, a definite date has not been set. This is a very enjoyable day with plenty of fox hunts, sight-seeing tours for the YLs and harmonics and many of the home who wish to see some of the district. Last year we had the usual boat trip on Brisbane Water as well as a bus trip to the local beaches and scenic points. This year will be much the same and the bus trip will be on a different route. A delicious salad lunch is included in the overall cost, morning and afternoon teas too. So really get your money's worth at Gosford.

We are always on the lookout for the people who travel the longest distance for that day and, of course, there is no need to say that all visitors and families are welcome. Hope to see a bigger crowd than ever this year—It's a good day for a family outing and everyone is catered for in a special way. 73, Mona 2AXS.

SOUTH-WEST ZONE

Over the Six-hour-day holiday week-end on the 2nd, 3rd and 4th of October, the 13th Annual Convention of the South-West Zone was held at Tumbarumba. Visitors arriving early Saturday and by lunch-time most were there. In the afternoon a visit was paid to Paddy's River Falls, one of the local scenic points. After this several visitors paid a visit to the local state fair.

In the evening the Dinner was held at the R.S.L. Hall with an attendance of over 50. At the end of the dinner a s.s.b. 80 metre hook-up with the Hunter Branch was made and Divisional President Ivan 2A1M at Newcastle (Hunter Branch) and Tumbarumba Shire President (C. L. G. Roth) exchanged greetings and together officially opened both Conventions. This is possibly the first time that such an opening ceremony has been held, evening concluded with some films of the Snowy Mountains Scheme.

On Sunday the field events took place at the Tumbarumba showground. Following the all-band scramble, there was a 2-metre hidden tx hunt. All present then enjoyed an excellent bar-b-q. The afternoon events included a second two-metre hidden tx hunt, a pedestrian tx hunt and a 2-metre fox hunt. During Sunday evening those who remained attended a slide evening when John ZEE showed a collection of the Snowy Mountains Scheme taken from the air.

On Monday a small party went on a tour of the western side of the Snowy Mountains Scheme.

Members present on Sunday took part in the VK/ZL Contest from a portable s.s.b. station at the showground. Over 60 people took part in the contest. The VK/ZL Convention will be held at Wagga Wagga.

Those who attended included VK's 2ZAA, 2ZAC, 2AJO, 2EU, 2ZEP, 2ZTM, 2ACQ, 2ZV, 2ZBY, 2APQ, 2RSW, 2AAT, 2ZAT, 2ZAJ, 2AEC, 2AY, 2UO, 2ZOO, 2AVP, 1VP, 3ZU, 3ZKK.

Results: All band scramble: 1, Bob 2EY; 2, Don 2AAL; 3, 2-metre Hidden tx hunt (morning): 1, Eddie 1VP; 2, Keith 2ZAA; 3, Sandy 2ZEX. 2-metre Hidden tx hunt (afternoon): 1, Sandy 2ZEX; 2, Don 2RS; 3, Tim 2ZTM. Pedestrian tx hunt: 1, Alan 2ZAT; 2, Leon Skeers. Fox hunt: 1, Sandy 2ZEX; 2, Kevin McLaughlin. Guess the frequency: Fred 2AAL; C. Sig. 2AAL. 73, John 2EE.

Thanks to the many trade houses for the excellent prizes.

The South-West Zone hook-up takes place every Monday night at 1000 G.M.T. on about 3890 Kcs.

The following regional Zone officers have been appointed for the South-West Zone (Area 5): Central Murray, Fred 2A1J, and for the Upper Murray, Peter 2ZEV for this year and John 2EE after January 1.

VK2 DIVISION

FAMILY PICNIC

At LAKE PARRAMATTA, on SUNDAY, 28th NOV., 1965.

ANNUAL CONVENTION

On AUSTRALIA DAY WEEK-END, at VKW1, Dural.

2 MX DX WEEK-END

On 1st, 2nd and 3rd JAN., 1966.

Select a mountain, form a team, collect all the other 2-metre gear together and join in with the VK2 operators who will be in the field over the New Year week-end.

Blue Mountains Section

ANNUAL FIELD DAY

On SUNDAY, 21st NOV., 1965, at LAWSON SWIMMING POOL GROUNDS.

Refer VK2 Notes, Bulletin and broadcast for details.

QUEENSLAND

TOWNSVILLE AND DISTRICT

Once again the time has come around to try and find something to write about. Not having any club notes to tell about I find it hard to manufacture something to say. Maybe in the not too far distant future we will again have a club in the district. Then there will be no lack of interest to write about. I have been along with the KVZ which was functioning the editor had to re-condense what I had written about. So that the other editors could get their fair allotment of space.

Since last writing a trip was paid to some of the boys in the far north. Harry 41K and I went to visit the boys at the QSO on s.s.b., while Basil 4ZV is still in the throes of hatching a superb receiver guaranteed to bring in the DX that no one else can hear. Basil 41K has built an audio oscillator to tune up his Viceroy. Now boasts that he has it right on the nose, not noise. Evie 4ZEF commends this time for the sound barrier, all the boys are in your corner hoping that you make the grade. I personally know that the YLs in Sydney are hoping to work you under your own call sign.

Ken 4KT hoping to get on the air again in November, very busy at the present furthering his studies with the KVZ. Ernie 4EL on 21 Mcs. on phone this time working the JA's and any others that care to call in.

Now that Seacom has a tower within 1/4 mile of my tower, suggestions will be welcomed to get a signal to the QSO. I will be in the v.h.f. to the boys in the far north for reliable QSO. 73, Bob 4RW.

SOUTH AUSTRALIA

The monthly general meeting of the VK3 Division was held to a well below average attendance of members in the clubrooms on the 1st of Tuesday. The reason for the low average attendance is hard to find, as the weather was on the mild side for the location. The meeting was of a high standard, and at the same time instructive and entertaining, but in view of the subject of the meeting, the presence of well-known members of Council, was among the absent, I do not propose to pursue the subject any further.

The lecture for the night was Mr. R. Mathews, Safety Officer for the Electricity Trust of S.A., who discussed at length the subject of electrical regulations and closed heart massage, together with an excellent film of American origin on the same subject. The lecture was most interesting, which at its conclusion saw quite a number of viewers a little green about the gills, due to its realistic presentation of the heart in slippage, slide, from life.

Added to all this, as a grand finale, there were two mannequins, and an exciting mannequin with the exotic name of Resuscitator, which were all used for practical demonstration, although I have been given to understand that Resuscitator was the largest queue of would-be learners, the one which entirely eludes me, but then this is only to be expected from one who has led a sheltered life, to say nothing of my shy, modest and retiring nature.

The vote of thanks for such an entertaining evening was duly given, and the result of the vote and the resultant applause from those present must have been music to the ears of Mr. Mathews, who undoubtedly went to a lot of trouble to demonstrate his subject.

Very little of interest came to light in the business section of the meeting, either Divisional or Federal, and the night came to a close at the ridiculously early hour of 10 p.m., much to the disgust of the caretaker's Assistant who had been the early part of the night mentally digesting his usual 11 p.m. supper of tweed, or possibly pure wool pants sent incidentally. I resent the suggestion of the rooming of the meeting, that it was a pity that I did not stop away from meetings more than I did, as the rooming of the meeting was an early part of the night. In my defence all I can say is, "I pay me subs. and I have me say," and the Devil "take the sheep" and the sheep "take the lion". However, if this is not plain enough seen me personally and I will be happy to make the

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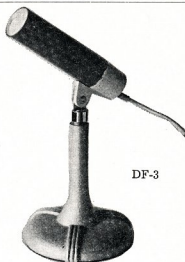
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HAMADS

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ANY offers for B.C. Car Radio advertised in last month's ad. Also for sale, Stromberg Carlson 3-speed gramophone, motor, turntable and pick-up, £3. A. W. Chandler (VK3LC), 1536 High St, Glen Iris, Vic. Phone 50-2556.

COLLINS S Line, 75S1 and 32S1, with power supply, mike, speaker. Complete top quality s.s.b. Ham Station, for urgent sale. VK2BRW. Phone 44-7701.

FOR SALE: Complete 50 w. a.m. Station, consisting of A.W.A. AMR101 RX with all coil boxes, Gelsos v.i.o. to 6DQ5 TX on all bands 80-10 metres, modulator, microphone and all power supplies and relays. A completely integrated and portable rig with p.t.t. facilities. £75 or near offer for the station. Do not wish to separate. H. L. Hepburn, VK3AFQ, 4 Elizabeth St, East Brighton, Vic. Tel. 96-2414 evenings.

FOR SALE: Eddystone 640 Receiver, 5-band Transmitter (Gelsos V.F.O. 6146 p.a.), Power Supply, Modulator, Microphone, Class C Wavemeter, Grid Dip Oscillator, Pye Receiver, 522, 3 c.p. tubes, Antenna Tuner plus s.w.r. meter, Q5er, Q'er, S meter, etc. You collect, £110. Crated for dispatch. £125. VK2YN, Picton. Tel. after hrs. 91312.

SELL: C.w. tx 30w., 815 in parallel, pi-coupled to antenna, driven by Gelsos multi-band v.f.o., two meters and key jack, p.s. included, all in black crackle cabinet, £15. J. Kitchen, 52 Railway Pde, Midland, W.A.

WANTED: General Coverage Receiver in first-class order for non-technical S.W.L. Also sell TBY Transceiver, as new, with phones and mike (28-80 Mcs.), £10. Phone 232-7480 (VK3ZKA) between 6-8 p.m.

WANTED: One kind person to lend a communications receiver to a very careful blind boy during Christmas holidays. Contact VK2AXK, St. Edmund's School for Blind Boys, Wahroonga, N.S.W. Phone 48-1684.

WANTED: To Buy: 6 mx or 2 mx Mobile Rig, complete and working. Offers to Box 206, P.O., Liverpool, N.S.W.

WANTED: 5-band s.s.b. Transceiver with power supply. State make, price and condition to VK6WG, Lot 622, Heytesbury St, Derby, W.A.

s.s.b. in the paragraphs. This must cease forthwith, as instead of being anti, it looks more and more like pro, and even might be, at the cross roads and about to desert a.m. Therefore, as from now I intend to refer when I unfortunately have to refer to s.s.b. to label it as "the thing", and in this way I will be able to keep the notes going without this horrible repetition of what they ever have to bring "the thing" into an otherwise quiet hobby? 73 de 5PS-Pansy to you.

WESTERN AUSTRALIA

We heard mobile Stan VK3ZE operating from Baledonia and heading in the direction of VK4 land, more than a companion, Mac, of whom I understand is ex of Menzies. Hope you enjoyed your tour of VK6 chaps. The liquid refreshments of Kalbar or didn't you try it? If you got tangled up with EDD and 8EP any old thing could happen.

Note a new call sign, VK6SW, congratulations Bill on the nice a.m. transmission and welcome to the 80 mx band, which is becoming very active again.

Len 6LG has been on the sick list up till 11th September. Sorry to hear this Len, we all hope you are O.K. now.

We have been hearing the voice of Alan 6AB from various shacks.

George 6GH is heading in the northern direction, both himself and XYL intend to enjoy the picturesque scenery and beautiful array of wild flowers that is to be found in the north at the time of the year, particularly in the Murchison area. I guess the camera and tele lens will be working overtime. Hope you strike good weather, George.

Have ideas that we may hear a station in operation some time soon from Leonora, "hurry up and get that ticket Brian." At the September meeting of the Institute a rather interesting talk was heard from Cedric 6CD, the topic being on solid state transceivers, one in which I waited 2-3 hrs. Noted also the wooden spoons were out as a few in particular discussed the future of some tx equipment which is available.

Most enjoyable evening was had by all. 73, 6KN.

TASMANIA

Short and sweet this month, I'm afraid, folks, though I expect you are glad, and have not got a moon either!

The October General Meeting was attended by 30 members and some half dozen visitors, including one, Ken 3AF, that well-known Melbourne fellow. Noted also, who sneaked into the clubrooms during the lecture and was not recognised until supper time, when Ted 7EZ muttered some remarks then shouted, "It's the VK3 President!" Trust you enjoyed your all-to-short visit in the Apple Isle, Ken, and hope we see you over here again in the not too distant future.

The lecture at the above-mentioned meeting was the second one given by Mr. Rod Sutherland, of the late "Radio Foundation" who's hope we may have a third lecture some time

soon. I feel sorry for those members who missed it, both lectures have been most interesting and enlightening, and I believe that the layman can understand the medical side of the situation. I think Len 7LE deserves a bit of praise for the beer he has come up every month with some of the most informative lecture on some subject allied to radio.

Another pair of visitors recently were Phil SNN (the VK5 Federal Councillor) and Kevin 3ARD, who were here in connection with the generation of power (50 cycles) so I am told.

Our weather, being the best from the Amateur's standpoint, winds in the 80 m.p.h. bracket and one gust of 90 m.p.h. recorded. Several local hawks were seen among aerials down were those of 7TX, 7EB, 7TA, 7ZMD, and yours truly.

There are two other calls to be heard locally (at present), they are Barry 7ZBJ and David 7ZMD, who were both successful in the July exams. Both lids are on 53 Mcs, at present, but will not be long before other bands are "under their belts."

VK7VI now sports 50 watts on 6 metres, and stal locked receiver, to a ground plane on the roof, and we hope soon to have a 322 set on 2 metres.

This year's Hamfest, to be held at Campbell Town on November 27 and 28, is a full State job, with the three zones all doing their share. The final success will depend of course on the weather. Do not miss it. Do not miss it. Turn up with the family and the mobile rig. See you there. 73, Geoff 7ZAS.

NORTH-WESTERN ZONE

The last social meeting of this zone was another very successful one with a large attendance. In addition to a very interesting talk. The meeting was devoted entirely to lectures and the first person to take the floor was Brian 7ZCS.

A blackboard was produced together with an ample supply of chalk, and when everything was organised, Brian carried on with what was to be a very interesting talk on acceptor and rejector circuits.

After Brian had stepped down, Gerald Wade, a young Tasmanian, who had been a test pilot, knew-how gave a talk on a 3-metre converter suitable for mobile operation. Gerald even brought along his own test rig, which he had built himself and which was beautifully constructed. With the aid of a circuit diagram Gerald showed the meeting the various stages of operation.

The last lecture of the evening was given by none other than that genius of electronics and radio, himself, George 7ZGS. George's subject was mobile antenna design and once again we were all entertained to a most interesting evening. I think I can say that George's pet subjects, complete with the actual working model of his 80-metre mobile and matching Balun, were a real treat.

After the lectures, supper was served in a 7ZRS/MS style. Among the crowd (it seems to be increasing every meeting) I noticed a new face—to wit, a visitor from Burnie, Jack Hillman. Welcome Jack and make yourself at home with the gang.

It was during supper that I first noticed a rather learned looking gentleman, who turned out to be treated by the main—being 7MX, busily engaged in positioning a notice board in full view of all and sundry. Now this zone never having been privileged with owning its own notice board—it caused me to see everyone pushed forward to have a rape—but soon receded rather quickly when they discovered the type of notice board I had together with a black list pinned on it. However, the message got home and a few paid up and had the notice board. The names struck off the black list. I asked Max why his name was still on the list and he replied that you can have something to write about!

The evening concluded with a rather complicated piece of radio equipment being brought forward by the main—being 7MX, loves, Sid 7SF. Now Sid being a bachelor, loves to fiddle with things and this is his latest drenchment. I don't know if he has ever been inside Sid's shack, but if you have not the best way of describing it would be to say it resembles a typical workshop. Hawthorn Radio mail order establishment. There must be just about every piece of ex-disposal equipment, procurable stacked in that small room all waiting for Sid to take it on to tinker with when his mood so decides. Don't forget the Hamfest at Campbell Town this month—bring along your family and your mobile outfit in the front seat even if it means having to shove your mother-in-law in the back, and make a day of it.

I will be there complete with powerful field glasses and various devices to catch more gossip for the December newsletter, so under then good DX and pleasant rag chewing. 73, David 7MS.

Repairs to Receivers, Transmitters; constructing and testing; xtal conv., any frequency; Q5-ers, R9-ers, and transistorised equipment.

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